# MODERN Shop



second operation work.



#### HOWARD CAMPBELL Editor

FRED W. VOGEL Managing Editor

ROBERT I. SHORE

GENE J. SCHWARBER Advertising Manager

NORMAN S. ROGERS Art Director

WILLIAM HARIG, JR. Circulation Manager

#### ADVERTISING REPRESENTATIVES

RICHARD S. KLINE GEORGE E. HAY 431 Main St., Cincinnati 2 MAin 0182

G. M. FILLMORE 342 Madison Ave., New York 17 Murray Hill 6-3899

> CHARLES H. DEILY, JR. 351 Mattison Avenue Ambler, Pennsylvania Ambler 0339

JOHN M. KRINGS Tribune Tower, Chicago 11 DElaware 7-5441

THE ROBERT W. WALKER CO.
684 S. LaFayette Park Place
Los Angeles 5
DRexel 4388

68 Post Street, San Francisco 4 SUtter 1-5568

#### MEMBER



Published monthly and copyrighted (1948) by GARDNER PUBLICATIONS, INC. 431 Main St., Cincinnati 2, Ohio

Howard (	Campbell	President
John M.	KringsVice	President
Granville	M. Fillmore Vice	President
Margaret	L. Gardner	Secretary
	S. Kline	

Printed in U. S. A.

# McChine Shop Contents Important Facts on Crush Dressing of Grinding Wheels...100

By E. C. Helfrich
Coolant Temperature Control Permits Faster Machining
Operations
Progressive Die Design, Part X120 By C. W. Hinman
Air Diffusion as an Aid in Precision Manufacturing
Operations
Todd Overhauls Huge Turbine156
Modern Equipment at Work
—Special Application Illustrates Versatility of Beckett Hi-Cyclic Air Valve
—Soldering and Degreasing in One Operation with Infrared
—"Zone Firing" Featured in Grinding Wheel Production
—Semi-Automatic Stud-Welding
—Michigan Shear-Speed Gear Shaper Increases     Production of Clutch Gears
—Carboloy Tipping of Guide-Rest Increases Service Life Between Grinds
Ideas from Readers
-Clamping and Drilling Grip, by E. R. Yarham182
Heavy Duty Casters Made from Old Bearing     Assemblies, by A. H. Waychoff
—Setting of Drilling and Tapping Stops Aided by Use of Setting Button, by Herbert Weitz186
—Method of Beading Small Diameter Tubes, by Bartlett West
News of the Industry
New Shop Equipment
Services Directory342
"Where to Get It"344
Cartoon348
Over the Editor's Desk350
Index to Advertisements

## LANDMATIC HEADS...for

TURRET LATHE
Threading Operations

"Only one cut is taken in forming the thread from the blank tube. This results in a tremendous saving in time over the former practice of chasing and grinding the threads, grinding being no longer necessary because of the accurate performance of the die head chasers," writes the manufacturer.



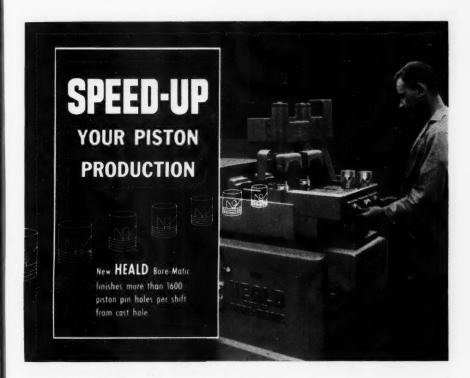
LANDIS

machine company

WAYN€SBORO, PA., U.S.A.

Illustrations show a 3" LANDMATIC Die Head used by a Western aircraft company to thread long Wing-Flap Retracting Screws to extremely close tolerances. An Acme thread of 2" diameter, 4 threads per inch, is being cut to a length of 451/2" on heat treated alloy steel tube 48" in length.

Write for Bulletins F-80 and F-90



The production of aluminum-alloy pistons, like so many other automotive parts, calls for very high standards of precision. But that's not all; parts must be produced rapidly, with minimum effort and attention. The new Heald Bore-Matics meet both requirements.

For example, the two-station, end-operated Heald Model 221 Bore-Matic shown above, handles (at 70% efficiency) over 200 pistons an hour—or more than 1600 pistons in one 8-hour shift. Designed for automatic, two-way boring of pin holes in two pistons simultaneously from the rough casting, this machine holds tolerances of less than .0001 for roundness, and .0002 or .0003 for size as required, under average conditions of stock removal (.040-.060 on diameter).

Whatever your borizing operations, you'll find a Heald machine that can meet your precise requirements—for faster, easier, lower-cost production. For further information on the new Bore-Matics, get in touch with your nearest Heald representative, or better still, call on us here at Worcester.

#### Are you ready for '49 production?

For the automotive industry, 1949 will be a year of challenge. For as production catches up with demand, there is more and more emphasis on cutting manufacturing costs, through the use of more efficient machine tools. These new machines are available now, to give you both increased production and greater precision, at lower cost. Heald engineers will be glad to discuss your specific problems.



THE HEALD MACHINE COMPANY, Worcester 6, Mass.

Breach Offices in Chicago · Claveland · Dayton · Datroit · Indianapolis · Lansing · New York

Head

mely

neter.

th of

1948

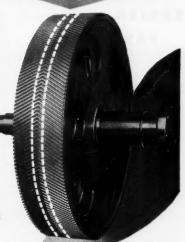
RIT



### ... you can buy BACKBONE

in any diameter up to 20 ft.

**BACKBONE** is that part of a Farrel gear where the helices meet to form continuous teeth. In conventional gears, this space is taken up by a useless center groove—required for tool clearance.



**BACKBONE** puts the entire face width of the gear to work, providing extra strength, greater load capacity and increased shock resistance-advantages in any size of gear.

**BACKBONE** comes in a wide range of sizes. The Farrel continuous tooth herringbone gear—the famous Gear with a Backbone, precision generated by the Farrel-Sykes process—is available in any size from ½ inch to 20 feet in diameter, ½ inch to 60 inch face, 24 DP to 0.75 DP—for practically any application.

Farrel engineers will be glad to assist you in working out unusual gear problems. Many years of experience qualify them as experts in the correct application of all types of gears. Information will be sent on request.

FB-470



#### FARREL-BIRMINGHAM COMPANY, Inc. Ansonia, Conn.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Chicago, Los Angeles, Tulsa, Houston

Farrel-Birmingham

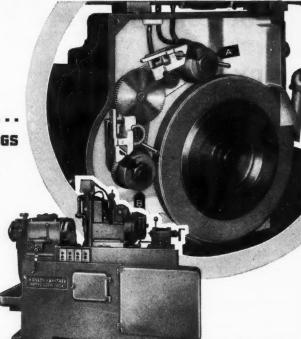
EASIER ...

FASTER ...

MORE ...

WHEEL DRESSINGS

at lower cost!



A FEATURE OF THE

#### HANSON-WHITNEY THREAT GRINDER

This page has been arranged for but one purpose . . . to induce you to see the new Hanson-Whitney semi-automatic Thread Grinder at work. It is impossible, in restricted space, to explain the importance of this engineering achievement . . . to provide the close-up photographs that bring out the many design innovations . . . nor can we show you the accuracy, the speed, the quality of production.

But we can arrange an appointment that we believe will interest anyone who needs a better, faster, method for grinding external threads from the solid on a production basis. You will see a Master Roll (A) that re-trues the Grinding Wheel for regrinding the Crusher Roll (B) in position, whenever its pattern has been worn by repeated crushing of the wheel.

This means uninterrupted production for a long time . . . until the original Master Roll thread pattern itself becomes worn.

This is but one valuable feature of this machine. If the 2" (long) threading capacity . . . produced in 1-1/6 revolutions of the work . . . meets your needs, we ask you to write us.

HANSON-WHITNEY MACHINE CO., HARTFORD 2, CONN.
Division of Whitney-Hanson Industries, Inc.







7HW48



FASTER operating cycle

FASTER speed changes

FASTER feed changes

FASTER

the (B)

1 by

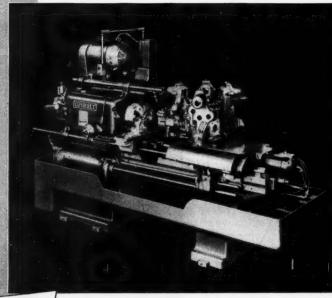
ong

ine.

iced

our

job set-ups



## FASTER production

THE GISHOLT ROUND TABLE represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts.

Your problems are



If you have work calling for a maximum number of surfaces to be machined in one chucking -investigate the Fastermatic. Six turret faces and two independent cross-slides provide a degree of flexibility not found in any other type of standard machine of comparable size. Completely automatic operation gives you the speed to cut costs on a wide range of jobs. Write for the Fastermatic catalog.

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

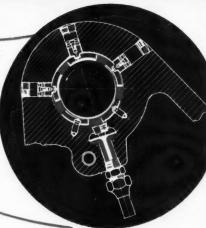


## You can forget



ALL CINCINNATI GRINDING
MACHINES AND CINCINNATI
CENTERLESS LAPPING
MACHINES ARE
FILMATIC
FOUIPPED





## about the spindle bearings

· · · IN CINCINNATI FILMA

Left: Close-up of a roll ground on a CINCINNATI FILMATIC Traveling Table Roll Grinding Machine, The FILMATIC reflection is indicative of the exceptionally good finish and accuracy which can be obtained on these machines. The everlasting FILMATIC bearings contribute their share in attaining these results. For brief data on the entire CINCINNATI FILMATIC line. write for general catalog M-1646.

Left: The FILMATIC principle. Self-adjusting shoes, submerged in filtered circulating oil, produce independent converging oil films which develop high radial pressures, maintaining "dead center" rotation of the grinding wheel spindle.



More than ten years ago, the first FILMATIC grinding wheel spindle bearings were installed in a CINCINNATI Grinding Machine. The resulting advantages were so great that shortly thereafter all CINCINNATI Grinders were FILMATIC equipped.

During the intervening years, over 99% of these machines have never required time off for the grinding wheel spindle bearings. And this period includes the war years, when machines were run all day and all night; many by inexperienced operators.

In addition to the big saving in maintenance, CINCINNATI FILMATICS offer an important incidental saving . . . you don't have to adjust them for finishing grinding. They're no worry at all—they're self-adjusting for any grinding condition from "cutting air" to the heaviest stock removal job that the motor will handle. There are other advantages, too. FILMATIC catalog G-578 tells you all about them.

#### CINCINNATI GRINDERS INCORPORATED

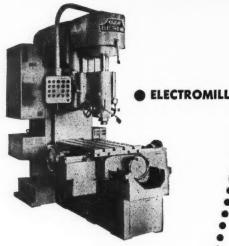
CINCINNATI 9, OHIO, U.S.A.

CENTER TYPE GRINDING MACHINES . CENTERLESS LAPPING MACHINES . CENTERLESS GRINDING MACHINES

1948

#### KNIGHT EQUIPMENT

.. to Boost Output and Lower Costs



Efficiently, economically handles large capacity work of many types: jigs, metal patterns, multi-cavity molds, jig boring with dial indicator, drilling, milling, machining light metals, etc. Infinitely variable range of speeds and feeds. Any combination of speeds and feed controls can be supplied or eliminated subject to customers requirements.



#### HOLE GRINDING **ATTACHMENT**

Accurately and quickly finishes holes and bores up to 6" diameter in hardened parts. Simplifies handling work too large to swing in standard machines. Special adaptors permit easy installation on any milling machine.

Write Today

for details and **specifications** 

MACHINERY COMPANY

MORE GOODS for MORE PEOPLE at LOWER COST

WEST PINE BLVD. . LOUIS B.



99% INCREASE IN CUTTER LIFE



64.9% INCREASE IN CUTTER LIFE



IIU%
INCREASE IN
CUTTER LIFE

#### -at no extra cutter cost

Actual performance tests of "SUPERITE"-Treated Cutters in customers' plants are shown in the accompanying figures.

"SUPERITE"-Treated Cutters represent a substantial saving in that they produce a greater number of gears per sharpening, and per total cutter life...resulting in an overall saving of productive machine time.

The process is exclusive with Fellows, performed only at our plant in Springfield, Vermont. Arrangements can be made, however, for cutting tests in your plant. Contact our nearest office.

Fellows

The Fellows Gear Shaper Co., Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Building, Detroit 2; 640 West Town Office Building, Chicago 12; 7706 Empire State Building, New York I.

1948



#### PLUS FEATURES MEAN LOWER COSTS

#### for precision toolroom and production grinding

The plus features of Landis Tool grinders make them the finest cost cutting tools of their kind.

Plus features that contribute to lower precision grinding costs are: A continuously adjustable speed motor driven headstock that permits you to select quickly and easily the best operating speed. Hydraulic traverse, hydraulic automatic wheel feed, conveniently grouped operating controls. Investigate Landis Tool features for your requirements.

10" x 24" Type CH Hydraulic Universal (Catalog I-45)

 Work Swing
 10¾"
 Wo

 Taper max.
 2"/ft.
 Flo

 Wheel size
 12"
 Ne

Work Speeds 55.495 R.P.M. Floor space 60½" x 106" Net weight 5700 lbs.

Help for your grinding operators—send for free illustrated book "Better Grinding."
World's Largest Manufacturer of Precision Grinders Exclusively.



LANDIS TOOL COMPANY, 16 EAST 6TH ST., WAYNESBORD, PENNA.

12

eseconds at every turn

# Put SKIL Drivers to work driving screws and running nuts!

Here's how to fell whether SKIL Drivers will really pay for themselves on your assembly jobs. Figure how many nuts must be run... how many screws must be driven. Then multiply by the seconds you'll save on every one when SKIL Drivers take over. You'll find you're figuring in hours and dollars before you know it.

SKIL Drivers bring you these big savings because they're extra fast. They're small and compact for use in tight corners . . . lighter and more perfectly balanced for easiest handling . . . and sturdily built for all your jobs. Ask your SKIL Tool Distributor for a demonstration today!



Corner Star Sever was printed tracks

Operator defermines point of discognization
by simply releasing preserve.

SKILSAW. INC., 5033 Eleten Ave., Chiese 50, El Featory Branches in Principal Cities in Canada

SKRTOOLS, LTD., 66 Portland St., Turender, Onk.

Tools



in Castra but a best form of the control of the con

g

ost

e:

its

lic

p-

ts.

## BIG THOMPSONS

for BIG SAVINGS

in Surface Grinding
year
after
year!

EXAMPLE NO. 1
Above—Thompson Heavy Duly Type CX
30" x 48" x 196" Hydraulic Way Grind-

Above—Thompson Heavy Duty Type CX 30" x 48" x 196" Hydraulic Way Grinding Machine with auxiliary vertical spindle for grinding safety gib, clamp surfaces and rack seats on machine bed. Working capacity of horizontal spindle, 240". Bed length 46 feet.

EXAMPLE NO. 2

At left—Thompson Heavy Duty Type CX 36" x 48" x 120" Hydraulic Surface Grinder. Equipped with super precision spindle powered with 40 H.P. motor.

The only manufacturer of a complete range of heavy duty and light duty surface and contour grinders for industry!

Write for new general catalog



Thompson
SURFACE
Grinders

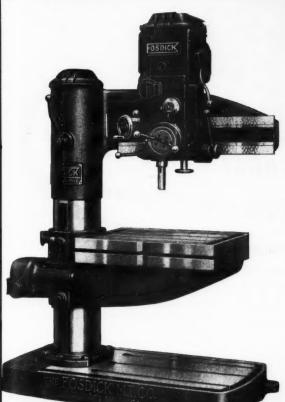
The Thompson Grinder Company, Springfield, Ohio Copyright 1948—The Thompson Grinder Co.

14

Where lots are small . . . Operations numerous . . . Hole diameter 1½" or less . . .

Here's your machine

### FOSDICK SENSITIVE RADIAL



• In developing the first Sensitive Radial FOSDICK have tapped a field that has long been a "problem child."

Built like a radial—looks like a radial—is a radial—but differs from a radial in that it is adapted to high speed sensitive drilling operations.

It features a sturdy one piece column—an arm set at fixed height which may be swung in an arc of 360°—a standard base plus an adjustable table which may also be swung in a 360° arc—a head of simple, sturdy design. This table arrangement permits locating table in correct position for any job suitable for the machine.

The radial design enables you to handle a wide range of drilling, tapping and similar operations at various center distances—easily—quickly—economically.



Full details of construction—specifications and operating data is available in the new FOSDICK Sensitive RADIAL bulletin R.S.A. Send for your copy today.

**FOSDICK** 

MACHINE TOOL CO. CINCINNATI 23, OHIO



Bulletin 92 is an analysis of short run piercing operations as applied to the piercing of sheets and plates up to 1/2<sup>n</sup> thick, produced on Wiedemann Turret Punch Presses with Gauge Tables.

Bulletin 92 shows the reasons why it was possible for a large manufacturer to cut production time on a special panel from 10½ hours to 73 minutes with a Wiedemann Turret Punch Press—and how another went into immedi-

ate production on a long run chassis contract while waiting for multiple dies to be made. Users report time and labor savings up to 2000% on short run piercing operations.

The Wiedemann Turret Punch Press with gauge table assures almost unbelievably low costs on short run piercing work. There is a size for every need — from 8 ton hand operated to 80 ton power driven.

Write today for your copy of Bulletin 92 — the answer to many a production problem.

WIEDEMANN MACHINE COMPANY
4219 WISSAHICKON AVE., PHILADELPHIA, PA.

WIEDEMANN TURRET PUNCH PRESSES & CAUCE

This manufacturer raised production SIX TIMES

on a bottleneck iobb

REPUBLICATION OF THE PRODUCTION O

To be sure you are getting everything you should from carbides; why not let our carbide specialist work with you, too?

WITHOUT doubt, a Carboloy tool was best for boring these forged steel connecting rods.

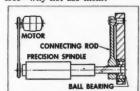
Yet the tool was boring only nine pieces per tool grind. Why so few? Because the crank bearing cap was a separate part—the cut was interrupted—stock in the hole was very uneven. These conditions made the job more difficult.

So a man with carbide experience was called in—a Carboloy engineer. After a careful check and some experimenting, he found that the carbide boring tool was all right, but the setup was not sufficiently rigid. So he suggested a piloted boring bar. When a temporary piloted boring bar was installed, the number of pieces per grind bored by the Carboloy Cemented Carbide tool was raised from nine to fifty—due in great measure to the ablity of carbides to work at higher speeds. A permanent bar is expected to double production again!

#### Call in your Carboloy engineer

A Carboloy engineer's carbide experience may help you with any such problem. His services are free—why not use them?

Let him assist



Let him assist with your special problems—and help you select the most economical tooling from more than 600 standard Carboloy tools and blanks, or special Carbo-

loy-tipped tools made by more than 150 tool manufacturers.

Contact your Carboloy engineer today—or write us direct:

CARBOLOY COMPANY, INC.



ng

ne

15.

le

n

er

Standards stocked by authorized distributors in 83 cities coast to coast.

CARBOLOY®

## N. A. WOODWORTH ENGINEERED PRODUCTS

#### ACCURACY YOU CAN TRUST



CONE-LOK JIGS

Chucks engineered and built by Woodworth guarantees the ultimate in precision gear chucking.

Woodworth Cone-Lok Jigs are noted for their mechanical simplicity and "life-time" construction.



**DIAPHRAGM CHUCKS** 



PRECISION GAGES

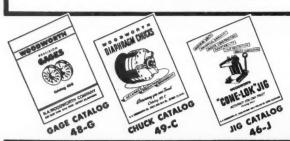
Woodworth manufactures a complete line of thread ring and thread plug as well as cylindrical plug and ring gages, Also produces special gages to customer blueprints.

N. A. Woodworth engineering gives you plus value in precision parts. Production men with "know-how" combined with well equipped plant are pace setters in aircraft engine and radar assembly fields.





PRECISION PARTS



#### WRITE FOR LITERATURE

New, comprehensive catalogs on N. A. Woodworth chucks, jigs and gages. Precision parts data supplied upon request for specific information. All inquiries should be on your company letterhead and mailed to address below.

### WOODWORTH

N. A. WOODWORTH CO., 1300 EAST NINE MILE ROAD . DETROIT 20, MICHIGAN
PRECISION GAGES . DIAPHRAGM CHUCKS . CONE-LOC JIGS . PRECISION PARTS.





Late cross slide operation and dwell is set for each slide on this rotary trip drum.



A simple pickoff gear selects the automatic speed range you desire.

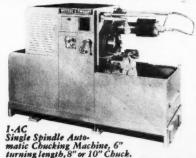


Easily adjusted"Quick-Set" mechanism controls automatic feed and speed changes and skip indexing.

#### The Versatile Single Spindle Automatic

HERE IS THE MACHINE TOOL that combines the flexibility of the turret lathe and the economy of the automatic. Camless operation eliminates expense and time lost in making, storing, finding, changing cams. Illustrations above show how setup time is cut to the minimum.

Nine big features make this the profitable machine for short and long production runs:



- 1. Eight ranges of four automatically selected speeds.
- 2. Any speed, within a selected range, may be set on any turret face and may be changed during the stroke.
- 3. Any three, out of eighteen feeds from .002" to .083", are automatically available during operation.
- Either or both cross slides can be selected to operate with any or all turret faces.
- 5. Turret can be automatically skip-indexed to eliminate unnecessary approach strokes.
- 6. Alternative hand control of all functions.
- 7. Reduced number of bearing surfaces and smooth shockless indexing retain original accuracy.
- 8. Advanced design reduces tool overhang for less chatter, closer tolerances.
- 9. Adequate chip clearance and capacity. Selector valve delivers coolant to operating station only.

You can machine it better. faster, for less . . . with a Warner & Swasey

WARNER SWASEY Cleveland

TURRET LATHIS, MULTIPLE & SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

# Let the RIGHT DRILL Save Money for You

The right "Buffalo" Drill will save money in any shop by providing ACCU-RATE SPEED in your drilling and faster setup changes. "Buffalo" Drills are precision-built machines—rigid for accuracy. All controls are easily reached, easily handled. Single and multi-spindle, floor and bench models, to suit your operation. Let us send you FACTS on getting your drilling costs down! Write for Bulletins!



"Buffalo" No. 14

High Speed Sensi-

"Buffalo" No. 18 Drills are available in twelve models to fit your operation. 1" capacity in cast iron. Bulletin 3123-B. "Buffalo" No. 15 Heavy-Duty Production Drill for fast work up to \( \frac{1}{2} \) holes. Bulletin 2963-D.

tive Drilling Ma- 2963-D. chine with capacity up to 3%" in the highest speed range. Bulletin 2726-D. "Buffalo" No. 16 Drills have sensitive and power feed—are available in 8", 12" or 15" overhang. Capacity up to 7%". Bulletin 2730-F.

Write for Bulletins!

#### BUFFALO FORGE COMPANY

388 BROADWAY BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



10,800 Stampings per hour using DANLY Precision Die Set



### two post set maintains accurate punch and die relationship

save time

DIE SET ASSEMBLY SERVICE

Use Danly's specialized service to save time and money. Assembly plants listed below (marked with stars) stack interchangeable parts for quick assembly and delivery of any standard die set to suit your specifications.

- \* Chicago 50, 2100 S 52nd Ave.
- \* Cleveland 14, 1550 E. 33rd St.
- \* Dayton 2, 990 E. Monument Ave.
- \* Detroit 16, 1549 Temple Ave.
- \* Grand Rapids, 113 Michigan St., N.W
- \* Long Island City 1, 47-28 37th St.
- \* Los Angeles 54, Ducommun Metals &
- Supply Co., 4890 S Alameda
- Milwaukee 2, 111 E. Wisconsin Ave.
   Philadelphia 44, 18 W. Chelten Ave.
- \* Rochester 4, 16 Commercial St.

This 9-station progressive die setup produces two small offset brackets at a time from AISI-1008 steel strip stock 1\%"x.071" at a press speed of 90 strokes per minute. The press delivers a gross production of 10,800 pieces per hour. A Danly all-steel two-post precision die set maintains tolerances of + .002" on the depth of the offset. Depth of embossing is held to .005".

#### 250,000 pieces per die grind

On a total production of 750,000 pieces, an average of 125,000 strokes or 250,000 parts has been obtained per die grind. The precision built into Danly Die Sets (leader pins and bushings are held to limits of .0002 of an inch) helps you obtain a longer die life and lower stamping costs. Get top performance—specify Danly Precision Die Sets for every job. They're available for any type of press operation.

#### OPERATION CHART

CUI-OFF IDLE FORM IDLE NOTCH NOTCH PIERCE IDLE EMBOSS

Note: Shaded holes show pilot positions.

Write for this free bulletin

Illustrates how Danly's machining and welding service for special die sets will help you save additional time and money

DANLY

DANLY MACHINE SPECIALTIES, INC.





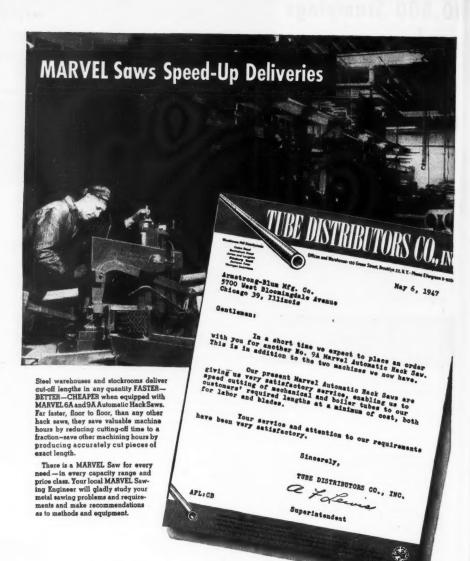








25 TEARS OF DEPENDABLE SERVICE TO THE STAMPING INDUSTRY





#### ARMSTRONG-BLUM MFG. COMPANY

"The Hack Saw People"

5700 BLOOMINGDALE AVENUE

CHICAGO 39, U. S. A.

.03

in

ing

ver du 85

for

## MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE So-owing PEOPLE" SENECA FALLS, NEW YORK



Problem: To turn, face, chamfer and thread Bearing Adjusting Rings in one operation.

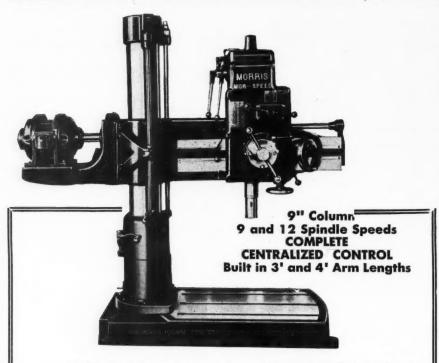
Solution: The Model "LR" Automatic Lo-swing Lathe selected for this job is equipped with a special, double lead longitudinal feed cam permitting a carriage feed of .021" for the turning cycle while the balance of the cam path is cut to correspond to the number of threads per inch required on the outside diameter of the rings. The rings, delivered to the lathe without any previous machining, are mounted on a special, air-operated driver and held in position by the bayonet type locking nut shown in the line drawing. Rough and finished rings are shown in the close-up illustration.

The machining operation is fully automatic; the turning, facing and squaring tools first start cutting, after which the special threading tool, which has provision for height adjustment, cuts the thread to size. The carriage and slides return to the starting position in rapid traverse and the machine stops, ready for reloading. Production on a 44% diameter ring is 63 pieces per hour at 85% efficiency.

Our Engineering Department is at your service to assist in developing machines and tooling engineered for your particular machining problems. Annual Continues on Type Service Continues o

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

### MORRIS Mor-Speed RADIALS



The Mor-Speed radial pays its own way . . . with greater production and cost reduction. It offers a variety of speeds and feeds so that a more perfect speed for each job can be selected.

Centralized controls and more automatic stops and trips save time. Additional safety devices protect the workman, the machine and the work. Automatic and constant lubrication prevents damage and saves time. Better alloy steels, better hardened surfaces, and added anti-friction bearings at every vulnerable point throughout the entire machine enable it to take punishment undreamed of a few years ago.

These features coupled with greater strength, rigidity and balance make the MORRIS Mor-Speed Radial the most profitable radial drill investment today.

WRITE FOR COMPLETE DETAILS





#### for LONGER CUTTING LIFE

For most economical production metal-sawing, pick the long-life GRIFFIN HIGH SPEED MOLBDENUM STEEL (Special Alloy) Hack Saw Blade. Machine and hand frame sizes.

To cut stainless, chrome, nickel and all other tough alloys, pick the GRIFFIN HIGH SPEED TUNGSTEN STEEL. Machine and hand frame size.

For any hand-frame use, pick the tough, all-purpose NEW GRIFFIN STANDARD TUNGSTEN. Flexible as a soft-back, durable as an all-hard.

For hand-cutting thinnest sheet, tubing, conduit, etc., pick the GRIFFIN NON-STRIP. Teeth don't snap out.

For precision contour cutting, pick GRIFFIN BAND SAWS. Four types for cutting metal, wood and other materials.

Write for latest Griffin Price List, giving full descriptions, sizes, selection tables, etc.

General Sales Agent

JOHN H. GRAHAM & CO., INC., Dept. D, Duane St., New York 7, N. Y.

ASK YOUR DISTRIBUTOR FOR

## GRIFFINE

HACK SAW BLADES and BAND SAWS

Made by G. W. GRIFFIN CO., Franklin, N. H., Hack and Coping Saw Blade Specialists since 1880

## True in 1899...True today... You Get BETTER MARKING with Panniez" Master Markers"

Steel Forging Stamps—Hand, Eye & Fullered



Embossing Dies (female shown)



**Stamping Dies** 

Famous in the steel industry for their durability and "good impressions", these Pannier "Master Markers" are still your best bet for efficient and clear-cut marking of steel and steel products. Write for full information today.



"Supreme" Steel Type & Holders

minimin

Extra Fillet, Double Bevel Steel Stamps letter, figure, symbol, name.



Roller Dies and Segments

Offices: Pittsburgh · Chicago · Los Angeles · Youngstown · Philadelphia



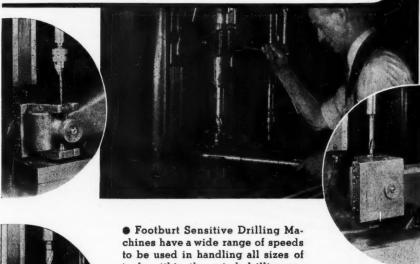
#### THE PANNIER CORPORATION

minimum

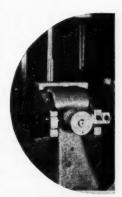
202 Pannier Bldg.

Pittsburgh 12, Pa.

#### A FULL RANGE OF SPEEDS FOR LIGHT OPERATION



chines have a wide range of speeds to be used in handling all sizes of tools within the rated drilling capacity of %" in mild steel or %" in cast iron. Standard speeds are 570 to 2300 RPM with 1200 RPM motor or 855 to 3350 RPM with 1800 RPM motor. The back gear attachment provides four additional slow speeds with a minimum of 185 RPM using the 1200 RPM motor or 277 using the 1800 RPM motor. Power feed and tapping attachments are available on any spindle to make production work easier and faster. Sturdy construction insures the maintenance of accuracy over many years of use.



THE FOOTE-BURT COMPANY • Cleveland 8, Ohio

Detroit Office: General Motors Building





## **HOFFMAN** fully automatic FLOTATION EQUIPMENT\_

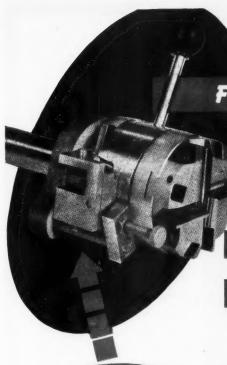
for COOLANT CLARIFICATION

Hoffman Flotation equipment is built in standard sizes with flow rates from 20 to 1.000 gallons per minute. Larger sizes built to specification.

The complete line of Hoffman coolant clarification equipment also includes Pressure, Vacuum, Cartridge and Disc Filters. Also, the new Hoffman Oil Conditioner Unit for removing soluble and insoluble impurities. Literature and a Free Survey are available without obligation—ask for them now.

Get full détails and a FREE Survey

U. S. HOFFMAN GORPORATION CORPORATION CODLANT FILTERS - FILTRATION ENGINEERING SERVICE



FOR SOFT STOCK

FINE PITCH

SHORT LENGTH

CLOSE-TO-SHOULDER

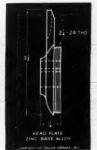
THREADING

#### SCRATCH JOBS LIKE THIS OFF THE TROUBLE LIST!

External Trip Attachment FOR ALL JONES & LAMSON STATIONARY TANGENT DIE HEADS.

Provides low cost threading in BRASS, ALUMINUM,
ZINC, PLASTICS and other soft materials. Cuts
as little as one full turn of quality
thread, with automatic release!

We believe we can help you. Why not call or write us about your threading problems?



Fine pitch threading in cast zinc alloy...
Material too soft to stand

pull-off pressure of ordinary die . . .

Overtravel dangerous due to close shoulder and projecting lug . . .

Quite a problem!

Yet a Jones & Lamson Tangent Die, equipped with an EXTERNAL TRIP ATTACHMENT, takes this job in stride. It trips without pulling against the threads—no danger of

stripping or side frimming. Precise stop control eliminates all risk to work, die or chasers.



Thread Tool Division

IONES&LAMSON MACHINE COMPANY
Springfield, Vermont U.S.A.

MACHINE TOOL CRAFTSMEN SINCE 1835

### ARTER



## Model 103 Hydraulic External Grinder

Built for light production jobs or toolroom work and priced accordingly.

Here is versatility. ARTER hydraulic grinder, external or internal... With internal head — capacity 1/6" to 3" dia. x 4" long— or external head — capacity 3" dia. x 10" long. Swing over table, 9".

Here is an economical, dual purpose grinder—internal only or external only—or both.



Internal grinding head with work head swiveled



External head swiveled with quick collet closing attachment and radius dresser.

ARTER GRINDING MACHINE COMPANY

WORCESTER, MASSACHUSETTS . U. S. A.



A Multi-Fluted Tap specifically designed to tap in all PLASTIC materials <u>successfully</u>

#### HERE'S HOW HY-PRO DID IT

PART: Molded Plastic Electronic Control Base.

**PROBLEM:** Develop a tap, for tapping special plastic electronic control base, that will hold thread size and have an average life of better than 500 pieces per sharpening.

HY-PRO SOLUTION: Hy-Pro Tap Engineers tested the material, then designed a NEW multi-fluted tap to meet specifically the job re-

quirements. Comparative tests with available competitive taps produced these results: 135 pieces per best available tap to 3200 pieces per Hy-Pro Plastics Tap.

Continued experience with leading makers of plastic parts has proved that this design will produce better results than any other tap, in any plastic.

Above is a typical example of how the Hy-Pro Sales Engineer can help increase threaded-hole production. His expert engineering counsel backed by the most up-to-date tap production methods combine to solve tapping problems rapidly and profitably.

Let Hy-Pro solve your tapping problem — call a Hy-Pro Sales Engineer today.

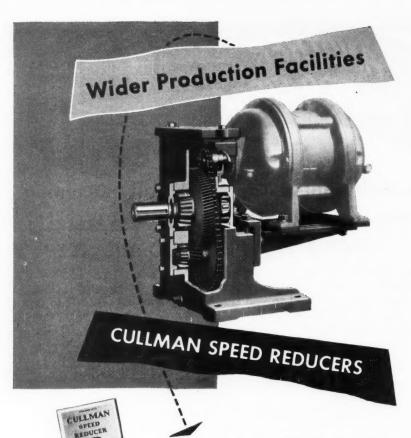
Order from your Distributor



HY-PRO TOOL CO.

NEW BEDFORD, MASSACHUSETTS

A SUBSIDIARY OF CONTINENTAL SCREW COMPANY



Write Today!—ask for your copy of the useful Cullman Speed 24 page Reducer Book. It is replete with blue prints, photographs and numerous tables of ratings, and prices to promote quick selection and delivery.

The wide range of Cullman speed reducers—¼ to 15 H.P.—provides the ideal size and type for most requirements. They enable you to achieve far wider production facilities for existing motor equipment.

Cullman drives, single and double reduction, are equipped with roller or ball bearings and sturdy' helical gears, all moving mechanism operating in oil. Flange type motors are directly connected to the reduction case.

#### CULLMAN WHEEL COMPANY

1352V ALTGELD STREET . CHICAGO 14, ILLINOIS





This new CP-455 Pneumatic Chipper has a built-in high velocity air jet which cleans off the work surface as though a blow gun were built into the tool.

A new type of non-wearing "Pulley-valve" and throttle regulate the force of the blow from a tap to a heavy hammer-stroke, making the CP-455 an all-purpose scaler. Ideal for chipping weld flux, paint, rust, scale, soot and dirt, and a dozen other applications. Immediate delivery. Write for Bulletin SP-2089.



PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

# WHEN YOU WANT MOVE TOOL LIFE

#### THY BARBER-COLMAN CARBIDE TIPPED MILLING CUTTERS

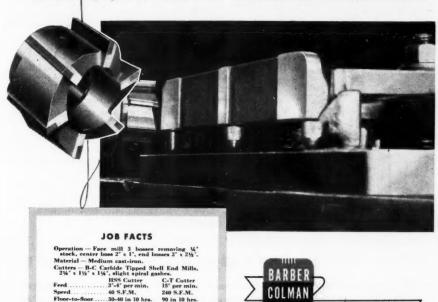
This job was slow and costly because of low tool life and high cutter breakage. Three intermittent bosses on cast-iron brackets required the removal of 11/4" stock. Hard spots and abrasive action of the material combined to shorten tool life by nicking and chipping the cutting edges.

After careful analysis of all factors, Barber-Colman Cutter Engineers recommended the use of carbide tipped shell end mills, with fewer teeth and slight-spiral gashes. Today, experience-lested B-C tip mountings and heat-treated high speed steel bodies are successfully withstanding the shock of the hard spots, and tool life and production are increased approximately 400%.

If your job conditions are suited to the use of carbides, consult a Barber-Colman representative on your next production problem. Experience the satisfaction that this manufacturer had in improving operation and increasing production.

### Barber-Colman Company

GENERAL OFFICES AND PLANT 182 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



90 in 10 hrs.

200 pcs. per sharpening.

Tool Life...... 50 pcs. per sharpening.

pe

IES

48

DEMAND Modern CUTTING TOOLS

MODERN MACHINES





MODEL 25 MARKING MACHINE

### because . . . this part has been marked for instant, positive identification.

Increase the value of your product—reduce the manhours lost in searching catalogs, matching similar parts. Reduce the confusion in sorting and storing. Make it easy for your customers to re-order from the positive identification on the part itself. At todays high production costs an unmarked part is an expensive luxury. The man hours saved in a few months will buy the finest marking equipment available.

Send us prints of your parts, showing the required markings and their location, plus your hourly production requirements. Our recommendations will be furnished promptly—at no obligation to you.

MARK IT & MARKET



GEO. T. SCHMIDT, INC.

1806 W. BELLE PLAINE AVE., CHICAGO 13, ILLINOIS

# Good News BIGGER

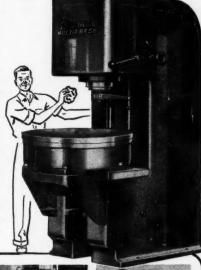
25-ton MULTIPRESS brings all the cost-cutting, production-boosting features of the famous bench-size models

Now you can get twenty-five tons of cost-cutting, work-speeding action for your bigger jobs-the same, fast, oil-smooth production efficiency and quick, accurate "feather touch" control of the popular bench-size MULTI-PRESS.

Because you preset the stroke length, approach speed, pressing speed and pressure of the MULTIPRESS ram to the precise needs of each task, you get maximum operating efficiency—no waste motion. And the MULTI-PRESS is fast; ram speeds up to 530 ipm.

Easy-working hydraulic controls, operating at preset pressure limits through safe, dual hand levers, make this 25-ton MULTI-PRESS simple to operate. Adding the MULTI-PRESS Index Table, or other feed devices, makes the job automatic!

Wherever you need up to 25 tons of speedy precision, you'll want to weigh the proved advantages of MULTIPRESS. Write for the full story! # REG. U. S. PAT. OFF.





This 4-Ton MULTIPRESS with Index Table accessory broaches serrations on 1600 small cams per hour.



6-Ton MULTIPRESS with heated platens performing drawing operation on leather camera cases. handles 20 per minute.



plugs on this 8-Ton MULTI-PRESS, with Index Table, at 19,000 blanks a day.



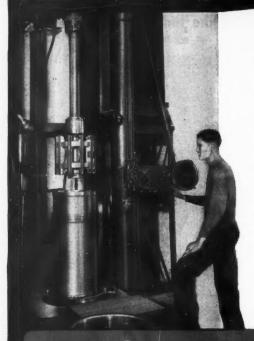
Flash is trimmed from pipe The MULTIPRESS Midgeta one-ton, high-speed production tool-is ideal for small parts work.

The DENISON ENGINEERING COMPANY 1153 DUBLIN ROAD COLUMBUS 16, OHIO



If your production involves finishing any type of cylindrical bore ranging from 1/2" to 30" 1.D. . . .

# FULMER HONING WILL DO IT FASTER!



Almost any type of internal cylindrical surface is a *boning* possibility. The cylindrical surface can be long or short, open at both ends, closed at one end, containing different diameters, ports, shoulders or interruptions in the surface to be finished.

All of these surfaces can be finished faster, and more economically, by honing on Fulmer Honing Machines. Large amounts of stock can be removed rapidly, reducing costs of preceding operations. Working tolerances as close as ± .0001" can be held on bore size, straightness, roundness. Any surface finish from 1 or 2 microinches up can be produced. And Fulmer Honing Machines are simple to operate—many users have unskilled labor running them efficiently.

Put Fulmer Honing to work speeding and *improving* your production now. Get full details today.

#### CHECK THIS FOR FAST PRODUCTION HONING:

At Hunt-Spiller Mfg. Company, a Fulmer Model 15-48 Honing Machine is used to hone  $12\,V_2''$  diam., 42'' length, Baldwin Gun-Iron Diesel Locomotive Cylinders, removing from .012''-.015'' of stock in from 10 to 12 minutes per piece.

#### C. ALLEN FULMER COMPANY

1233 First National Bank Bldg., Cincinnati, Ohio

### **FULMER**

#### PRECISION PRODUCTION - EQUIPMENT

★ Honing Machines • Honing Tools • Rod Borers • Piston Ring Lappers

### We Did It 35 Years Ago – It's Still A New Idea! OLIVER DIE MAKING MACHINE



Back in 1913 we conceived the idea of making dies by sawing metal with a jigsaw and filing by machine methods, instead of removing surplus metal by drilling holes and chipping. We found this new method to be faster and more accurate by far, and introduced it to the metal working industry. The small machine at left is our current model, an efficient and economical bench model for I" materials. Below right is shown today's Heavy Duty model, king of die making machines, designed for sawing, filing and lapping in tool steel up to 3" thick.

Oliver Die Makers have been cutting costs for thirty-five years, saving up to 60% and better over hand methods of making die, gages and cams. They are in use in most of the civilized countries of the world, and are available in a model for your every need.

#### TO SOME THIS STILL IS A NEW IDEA

If you are not familiar with the benefits to be gained through the use of Oliver Die Makers, write immediately for free descriptive literature.

1430 E. Maumee Street, ADRIAN, MICHIGAN







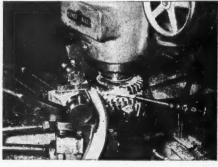


Gear Cutting-Cities Service lubrication engineers making on-the-spot analysis of gear cutting operations are daily cutting costs in all types of plants.

Broaching-In this type of operation the skilled services of a Cities Service lubrication engineer can mean substantial savings in time, work and money.

LUBRICATION PRODUCTS AND SERVICES

# ED TO GREATER P





Milling operations can be speeded, tool life increased and finish improved with the right type of cutting fluids. Ask for a Cities Service recommendation.

Lathe-By following the product recommendations of a Cities Service lubrication engineer here you may materially increase the quality and finish of your production.

Send for free information-packed booklet entitled "Metal Cutting Lubrication." Address: Room 276. Sixty Wall Tower, New York 5.

CITIES (2) SERVICE

# BE CIED

... The Name SUPREME in Shapers



Advanced Leadership in Design and Engineering

- + FIRST for Precision with Ruggedness ...
- 7 FIRST for Adaptability ...
- \* FIRST for Increasing Production at Reduced Cost

The Shapers with the Exclusive LUBRIGARD

SAFETY AND DEVICE

GENERAL ENGINEERING & MFG. CO.

ST. LOUIS TE, MG.

THE LINE ON WHICH TO STANDARDIZE FOR A HIGHER STANDARD OF RESULTS

## A New Year's message to our friends

As a difficult year draws to a close we take this opportunity to express appreciation to our many customers for their business and for their patient understanding.

The unusual demand for steel created an almost insurmountable problem for the industry.

We tried to meet this situation to the best of our ability. New

warehouses increased our facilities in 1948 and further improvements are planned for 1949. We are now at your service from coast to coast, determined to serve you

Meanwhile, let us extend our better. sincere best wishes for a happy holiday season and a successful New Year.

### SUPPLY COMPANY

BALTIMORE · BOSTON · CHICAGO · CLEVELAND · LOS ANGELES · MILWAUKEE DALIIMUHE BUSIUN GRIGARU GEEVELANU LUS ANDELES MILMAUREE NEWARK PITTSBURGH ST. LOUIS SAN FRANCISCO TWIN CITY (St. Paul)



# uts grinding time in half

Savings pay for tools in 5 months

THIS manufacturer of materials handling equipment was using universal electric grinders when the Rotor Application Engineer called to find ways of cutting grinding costs. The Rotor Application Engineer recommended replacement with Rotor Air Grinders and demonstrated them with these results:

Grinding time cut 50% due to greater cutting power and higher speeds.

Operating conditions improved with lighterweight, cooler-running tools.

In labor savings alone, Rotor Air Grinders actually paid for themselves in 5 months.

Similar possibilities may exist in your plant too. Call the Rotor Application Engineer for an unbiased analysis of your needs.

AIR O'TOOL



AIR

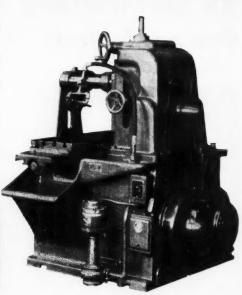
THE ROTOR TOOL CO.

CYCLE

CLEVELAND, OHIO

experience shows you get better performance with

RUTHMAN GUSHER COOLANT PUMPS





Oversized pre-lubricated bearings, totally enclosed motor, split second control of coolants, electronically balanced rotating assembly, no metal to metal contact are only a few of the unique advantages that Ruthman Gusher Coolant Pumps offer. You will get long life, better performance with Ruthman Gusher Coolant Pumps on your machines.

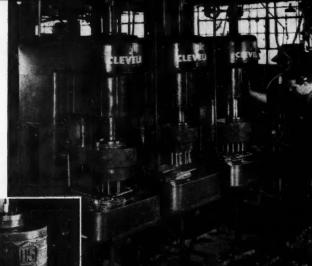
Illustrated above is a Kearney & Trecker Model M-24 Simplex Milling Machine equipped with Model 11022 Long, 1/4 HP Ruthman Gusher Pump.

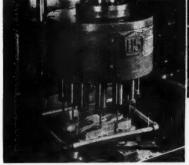
THE RUTHMAN MACHINERY CO.

1817 Reading Rd.

Cincinnati 2, Ohio

## NEW HIGHER TAPPING SPEEDS





### in precision

### single and multiple hole work



Users find that the interchangeable lead-screw feed, and heavy roller-bearing mounted spindle of the Model E Cleveland Lead Screw Tapping Machine permit single and multiple-hole tapping—even on Class 3 and 4 fits—at speeds never before possible.

The precision depth control enables even an unskilled operator to tap blind holes with safety. The exclusive, super-sensitive clutch eliminates tap breakage and reduces wear; as many as 10,000 holes are frequently tapped without regrinding.

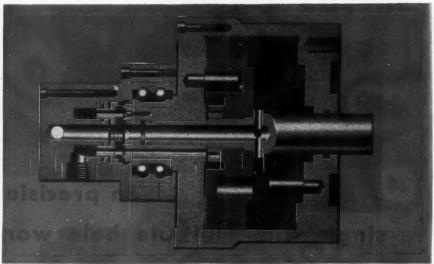
Automatic cycling with indexing, cross-slide or hop-

per feed, permits fully automatic operation.

clevel AND Complete range of sizes for tapping holes up to 23/4" N.C. thread in mild steel. Write for bulletin.

THE CLEVELAND TAPPING MACHINE CO. . Hastville Obio

# HIGH SPEED AIR CYLINDERS



New positive pressure-balanced air seal and lock that reduces air leakage to a minimum.

Precision forged aluminum alloy construction with lapped bores. Light weight . . . low flywheel effect . . . long troublefree service.

Large air ports and low inertia result in much faster action . . . savings in time on short run operations.

Entire cylinder statically balanced after assembly for smooth operation at speeds up to 5000 r.p.m. for 3½" to 8" sizes.

31/4" to 18" sizes. Write for further information.

a feature of CUSHMAN
POWER CHUCKING EQUIPMENT

CUSHMAN also manufactures a complete series of WRENCH OPERATED CHUCKS Write for Catalog 63 and Bulletins



Send for Catalog PO-63 for information on Air Operated Power Chucks.

THE CUSHMAN CHUCK COMPANY
HARTFORD 2, CONN

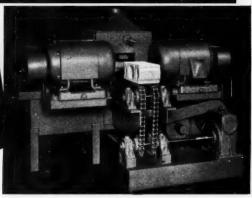
100548

and

on Tough Materials



Gardner
DOUBLE
Grinding!



WORK DATA Part Building Blocks

Material Concrete
Operation Strind Two
Parallel Ends

Tolerances Clean up and Hold Commercial Squareness

Stock Removal

Production 8 Blooks Per Minute Feed Hand Load to Chain Conveyor

Machine 20. 163-20" Bardner Double Brinder

GARDNER - GRIND YOUR Flat SURFACES

ARDNER Double GRINDERS successfully grind an endless variety of parallel-surface products — made of almost every conceivable material. In the example above, TWO ends of concrete blocks are being squared up with ONE pass through the machine. A chain conveyor carries them between two opposed grinding wheels.

If your plant is faced with a difficult flat-surfacing problem, it will pay you to find out how GARDNER Double GRINDING can raise your volume of work, and lower your production costs.

Write for Latest Bulletin on Gardner DOUBLE Grinding!

DNER MACHINE COMPANY

428 East Gardner Street \* \* \* \* Beloit, Wisconsin, U.S.A.



Season's Greetings

\* \* To our customers and friends we wish a Merry Christmas with the sincere hope that its joy and gladness may be but the forerunner of a New Year of golden days rich with happiness and health, success and content.



# NEV

Dumore Power-Flex Flexible-Shaft Tool

makes light work of heavy-weight jobs



Motor—Dumore full ¼ HP at 10,000 rpm (DC to 60 cycle AC) 15,000 rpm no-load speed.

Handpiece - Dumore 2-204, ball bearing, 4" chuck with 4" sleeve adapter.

Dumore gives you the power. mobility, and rugged durability you want for flexible-shaft work

Put the new Dumore Power-Flex on duty in your shop and watch the sparks fly. It's a fast, powerful tool - built to stand up under full-shift industrial schedules, and do a workmanlike job in those many hard-to-reach locations.

The versatile Power-Flex makes your work easy. Its motor is swivel-mounted on the hanger-plate to relieve shaftstresses for work in any position. The hanger-plate provides for either bench or hanger mounting. The heavy-duty

shaft is flexible enough for easy maneuvering, yet sturdy enough to stand long use.



You can use the new Dumore Power-Flex with either of two lightweight handpieces for sensitive control: the ball-bearing 2-203 with 0-1/8" Jacobs Chuck, or the ball-bearing 2-204 gives you a 1/4" capacity chuck with 1/8" adapter sleeve for a full range of tool sizes. The Dumore Handy-Sandy polisher and sanding attachment doubles the usefulness of the Power-Flex. Be sure your flexible-shaft work is

in the best possible hands. Put Dumore's Power-Flex on the job!

> The Dumore Handy-Sandy Attachment

— fits right onto flexible-shaft for sanding, polish-ing, cleaning, finishing, chamfering, removing rust and paint, and hundreds of other jobs.



The Dumore Duo Flex Flexible-Shaft Tool Motor — 1/15 HP (DC to 60 cycle AC): Speeds: 3000 to 15,000 rpm di-rect, 500 to 3,500 rpm off gear unit.

more 2-203, ball bearing, with No. 0 Jacobs Chuck (0-1/8").

WISCONSIN Pat. off.

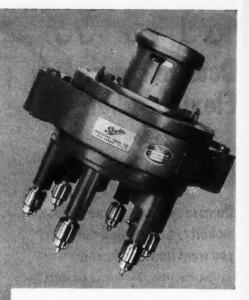
	Send me complete information on: The new Dumore Power-Flex Flexible-Shaft Tool. The Dumore Dual-Speed Flexible-Shaft Tool. The Dumore Handy-Sandy Attachment for Flexible Shaft Tools.
Nan	ne
Com	panyPosition
Add	ress
City.	() State

Be Sure..
SPECIFY

Buhr

MULTIPLE SPINDLE
DRILLING AND
TAPPING HEADS
FOR
PRODUCTION

BUHR BUILDS ALL
TYPES OF SPECIAL
FIXED CENTER AND
ADJUSTABLE
MULTIPLE HEADS
FOR HIGH PRODUCTION UNDER SEVERE
OPERATING
CONDITIONS



Buhr Standard Adjustable Drilling and Tapping Heads are engineered and built to deliver high production at low unit cost. Fully adjustable, 2 to 8 spindles, for short or long runs. Rapid set up, models for all presses. Antifiction bearing throughout. All gears are shaved, spline broached and induction hardened. Shafts and spindles splined.

Model 06-F-2 shown with No. 2 Jacobs Chucks also is available with spindles for Buhr Collets or with No. 1 Morse Taper. Drill capacity is fs", cast iron, minimum between center, 1½". Buhr steel-bushed guide-bar bosses are available for precision alignment with fixture.

CATALOGS AVAILABLE FOR YOUR SHOP LIBRARY.

BUHR MACHINE TOOL COMPANY

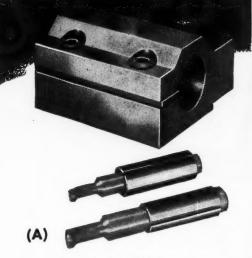
845 GREEN STREET

ANN ARBOR, MICH



### Now YOU CAN ADAPT All BOKUM BORING TOOLS TO TURRET LATHES

The same notable economies that users of Bokum Long-life, Precision Boring Tools have been enjoying for over a decade on lathes and boring mills are now extended to operators of turret lathes—through our development of Turret Lathe Tool Holders, shanks and adaptors.



Holder BT-24 (top) has  $1\frac{1}{2}$ " bore. Accommodates split bushings (A) to hold  $1\frac{1}{4}$ " and 1" shanks for Bokum Tools Nos. 4 to 12 to give you boring range  $1\frac{1}{16}$ " to 2" min. dia.

You have but one investment in shanks; only cutters need be replaced.

Adaptor B-100-70 (below) fits holder. Has  $\frac{3}{4}''$  bore to hold Bokum Tools Nos. 00000 to 3, giving you theoretical boring range  $\frac{1}{16}''$  to  $\frac{3}{6}''$  min. dia.



Ask for folder B-1048 giving complete information.

This combination increases efficiencies in boring operations. It brings you advantage of using entire range of Bokum Tools on turret lathes.



BOKUM TOOL CO.

14775 WILDEMERE AVE. . DETROIT 21, MICH.

SINGLE FOINT BORING 10015-INTERNAL THREADING, BOTTOMING AND FACING TOOLS-CARRIDE TIPPED 10015

52



ternal and external spindles . . . swit 80° to position either spindle. Found only a new Rivett 1024t

and shoulder surfaces, Rivett 1024 has these new features to help you cut "set-up" time drastically: 1. Double-end wheelhead - Exclusive! Two spindles on swiveling workhead make possible rapid changes to internal or to external work. 2. Hydraulic table reciprocation - infinitely adjustable for speed and length of travel. 3. Graduated swivel table and sine bar on workhead - assure accurately measured tapers and angles. 4. Optional work holding methods - uses collets, step chucks, jaw chucks, plates, fixtures

and external grinding work on straight, taper, two-angle, face

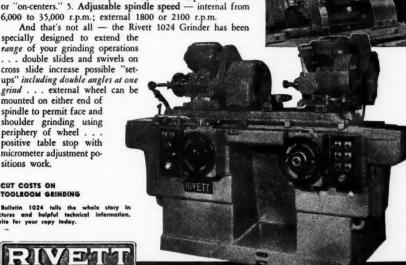
6,000 to 35,000 r.p.m.; external 1800 or 2100 r.p.m. And that's not all - the Rivett 1024 Grinder has been

specially designed to extend the range of your grinding operations . . . double slides and swivels on cross slide increase possible "setups" including double angles at one grind . . . external wheel can be

mounted on either end of spindle to permit face and shoulder grinding using periphery of wheel . . . positive table stop with micrometer adjustment positions work.

#### CUT COSTS ON TOOLROOM GRINDING

Bulletin 1024 tells the whole story in pictures and helpful technical information. Write for your copy teday.



LATHE & GRINDER,

BRIGHTON BOSTON - MASSACHUSETTS . U. S. A.

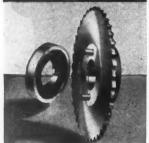


Only the M. & M. Triple-Chip Method gives you exclusive, important advantages.

#### Solid Type Blade

overhead, M. & M. Triple-Chip Saw Blades from 11" to 70"

diameter are segmental with many distinctive features.



Triple-Chip slitting blade (dual drive).

#### for Cut-off and Milling Operations

M. & M. solid blades 3" to 18" diameter, of high speed steel, with a range of rake angles and tooth spacings, will meet your exact needs. Triple-Chip features insure high production and unmatched accuracy. M. & M. saw blades have taper ground sides for clearance and a flat hub for mounting. Standard tooth spacings are furnished without extra cost. A standard line of milling saw blades is available. Any arbor size can be accommodated. Standard blades are available for plastics and other non-ferrous materials.

Write for our Bulletin "D-12"

THE MOTCH & MERRYWEATHER MACHINERY CO.
PENTON BUILDING . CLEVELAND 13, OHIO





# You Can't Pry Em Loose!

The natural whole diamonds in Willey's Diamond Dressers are mounted in Willey's Metal. They can never work loose. You use them down through the last layer. Being of a size to pass through a 15-20 mesh screen they present many cutting edges that give you better performance and lower dressing costs than tools costing much more.



# WILLEY'S DIAMOND DRESSERS



Tops for dressing rough, semi-finish and finish grinding wheels for all makes of grinders. Tops for dressing wheels to grind hardened parts requiring a precision ground finish.

Give Them a Trial!

Judge by Results!

#### WRITE FOR CATALOG

No.	Usable Contents of the Diamonds		QUANTITY PRICES				Wheel
	Diameter	Length	1-25	26-50	51-75	76-100	Diameter
W-3 W-4	5/16	5/16 3/8	\$11.00 13.00	\$10.00 12.00	\$ 9.00 11.00	\$ 8.00 10.00	6 to 12
W-5 W-6	5/16 11/ <sub>32</sub> 3/8 7/ <sub>16</sub>	13/ <sub>32</sub> 7/ <sub>16</sub>	15.00 17.00	14.00 16.00	13.00 15.00	12.00 14.00	20 to 24 24 to 42

#### WILLEY'S CARBIDE TOOL CO.

SHEE MAKERS OF WILLEY'S METAL

1342 W. Vernor Highway

Detroit 1. Michigan

# -WHATE

ENGINEERING CO.

# WHYTE ROLL FEEDS

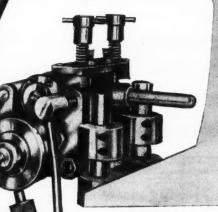
for Fast, Accurate Continuous Feeding

- STOCK MODELS AVAILABLE TO FEED FROM 0" TO 12" AND UP TO 14" WIDE
- LARGER MODELS ON REQUEST
- RUGGED WELDED STEEL CONSTRUCTION
- TIMKEN ROLLER BEARINGS
- ALL CUT STEEL GEARS
- EASILY ADJUSTED TO PROPER DIE HEIGHT
- SINGLE AND DUAL FEED AVAILABLE
- ALL FEEDS WITH
   2 ROLL LIFTS, AUTO-MATIC AND
   MANUAL FOR
   CONVENIENT
   LOADING
   OF STOCK

Immediate Delivery

# ENGINEERING CO.

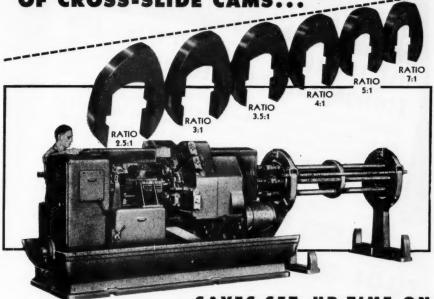
185 ROWLAND ST. SPRINGFIELD 7, MASS. Write for Detailed Illustrated Literature



Also Manufacturers of

Dial Feeds
Slide Feeds
Pick-Off Attachments
Stock Straighteners
Lamination Dies

UNIFORM HIGH POINT OF CROSS-SLIDE CAMS...

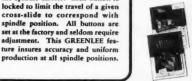




No matter what ratio cross-slide cam you select, the high point is always the same distance from the center of the cam shaft. This means that cams can be changed at will after cross-slide feed adjustments have been made without baving to re-adjust tools or holders. When trying out a set-up for best rates of cross feeds, this GREENLEE feature provides an obvious and substantial saving in time.

#### CROSS-SLIDES INDEPENDENTLY OPERATED

On the GREENLEE "6", each crossslide has its own individual feed cam, so the feed rate of each slide can be set independently of any other. This affords maximum set-up flexibility, and permits selection of the best feed rate for each cross-slide tool. Cams are standardized and designed to provide a range of cross feed rates which are in simple fractional relation to the main tool slide feed rate. Cams are fully interchangeable — any cross-slide cam can be used on any cross-slide cam can ing a substantial saving in cam expense.



Send for Literature
Write today for Booklet
and Circular giving full
information on all
GREENLE features and
describing the advantages of the new LeadScrew Feed for heavyduty precision threading.
Learn why the Greenlet
"6" is often called "The

GREENLEE

GREENLEE BROS. & CO., 1892 MASON AVE., ROCKFORD, ILLINOIS

MULTIPLE SPINDLE DRILLING, BORING, TAPPING MACHINES . AUTOMATIC SCHEW MACHINES . AUTOMATIC TRANSFER PROCESSING MACHINES

COMPENSATING STOPS

SET AT FACTORY AND

SELDOM NEED RESETTING

Compensating wheels (see above) carry adjustable hardened steel stop buttons and index in unison with the spindle carrier. Each button is

# ESPECIÁLLY FOR TODAY'S NEEDS...

# USE EX-CELL-O TOOL GRINDERS FOR ECONOMICAL TOOL RECONDITIONING

Ex-Cell-O tool grinders cover a wide range of work—from the needs of small shops that require economical equipment to condition cutting tools only occasionally, to the needs of these larger plants that regularly grind tools in large quantities. Ex-Cell-O grinders enable manufacturers to reach the highest efficiency in tool grinding, cut down grind-

ing time, improve finish, speed up production, and prolong tool life. EX-CELL-O Another feature of each Ex-Cell-O grinder is an ease of operation that

OOL GRINDERS



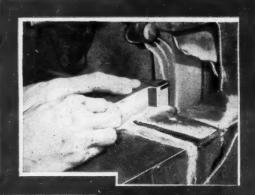
tor atticion and economical snarpari-ing of single-point tools . . . carbide, stellite-type and high speed steel

perform accurate grinding in a minimum of time. Send today for Catalog 46262 showing complete line of Ex-Cell-O's standard tool grinders. 48-42

enables a relatively inexperienced operator to

# the grinding job

Off-hand sharpening of a carbide tipped tool, on 14" Hammond Tool Grinder. Widespread and increasing use of these tools makes this an important every day operation in many plants. Correct wheel selection for this specialized work is essential for efficient sharpening without damage to carbide tips.



### the wheel

G Electrolon, GC80.19.V3, 14" x 4" x 11", plate-mounted, Type PM, specially developed to prolong the efficiency of cemented carbide took with economical grinding cost. Accepted as a stendard of excellence throughout industry.



Borolon ALUMINUM OXIDE Electroion

SIMONDS ABRASIVE CO.

PHILADELPHIA, PA.

**Grinding Wheels** 



where to get it

Simonds Abrasive Distributors in all principal industrial centers in the U.S. and in many foreign countries carry stocks and can advise on grinding wheel selection. Write now for Bulletin ESA-181 "GE lettrolon Wheels for Carbide Tool Grinding". Also request name of nearest distributor.

Every size and shape for every grinding job . . . centeriess, crankshaft, cut-off, cylindrical, internal, knife grinding, mounted points, portables, roll grinding, saw gumming, snagging, surfacing (wheels and segments), tool and cutter, bricks, sticks, stones and abresive grain for polishings oressure blasting, anti-slip, etc.

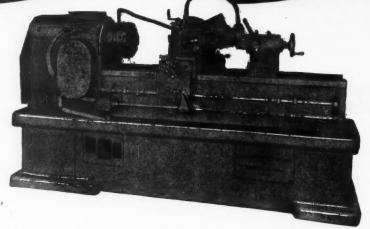


Simonds Abrasive Company, a major manufacturer of grinding wheels and abrasive products exclusively, maintains a modern electric furnace plant at Arvida, Canada. Here the crude abrasive used in making Simonds grinding wheels is produced. Thus, product quality is controlled from the source, assuring you of lasting performance, top efficiency, better economy when you use Simonds Abrasive wheels on your grinding jobs.

SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PENNA. . DISTRIBUTORS IN ALL PRINCIPAL CITIES

ALWAYS OUTSTANDING NOW IT'S EVEN BETTER!

the Coulter threadmastes



CHECK and COMPARE

MORE DEPENDABLE Anti-friction bearings and spiral and worm gears in Cutter Spindle

MORE EFFICIENT Full size spindle and balance wheel on both ends of Gutter Spindle Drive.

MORE CAPACITY 59 speed changes possible with standard equipment. Cut threads from 1/3 to 20 per inch and diametral leads from 7 to 20 in single, double and triple worms, and leads from .050 to 3.000.

MORE PRODUCTION Mill hard and soft materials with carbide tools.



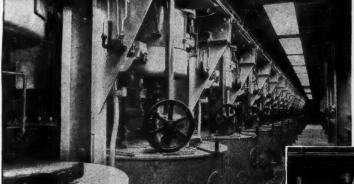
The Thread Milling Machine that produces long and short precision traversing elevating, cross-feed and lead screws in LESS TIME!

the James machine Co. BRIDGEPORT

WRITE FOR PARTICULARS about the "THREADMASTER" . . . the Thread Milling Machine of tomorrow . . . threading it better and faster, today!

CONNECTICUT

# 60 lb. "Manual Lifts" Eliminated



Battery of 17 Roberts "Centrif. ugals," built by Western States Machine Co., installed in new \$6,000,000 plant of Holly Sugar Company near Brawley, Calif.

#### Feed-Pipe Gates on 17 "Centrifugals" Operated by NOPAK Air Cylinders and Valves

A battery of 17 Roberts semi-automatic "Centrifugals" are employed in this modern plant to spin the molasses off the sugar crystals. To simplify the task of charging each centrifugal, the feed-pipe gate . . . which formerly required an awkward, manual lift up to 60 lbs. every 4 to 6 minutes . . . is now raised by the flick of a NOPAK Valve lever which controls a NOPAK Model E, 4 x 13" Air Cylinder.

In a normal 8-hour working day, over 1600 manual lifts of 60 lbs. each are eliminated. Machine operators are relieved of unnecessary strain and fatigue, and machine efficiency is maintained at the high level characteristic of this new \$6,000,000 plant,

NOPAK Valves and Cylinders can help you achieve higher efficiency in your plant, or in your product.

Close-up view of a Roberts Centrifugal shows a NOPAK Model E Air Cylinder which operates feedpipe gate, and 3/8" NOPAK 4-Way Valve which actuates cylinder.

#### GALLAND-HENNING MFG. CO.

2758 SOUTH 31st STREET MILWAUKEE 7, WISCONSIN



December, 1948

d

ė

th

to

20

ds

ls

ding

MODERN MACHINE SHOP





This could be YOUR dock foreman . . . reporting on the prompt service rendered by your Union Drawn Distributor.

Ever wonder how your Union Drawn Distributor does it . . . time after time? First of all, he has located his warehouse near users of cold finished bars and shafting, thereby making every delivery a short haul. Secondly, he has stocked this warehouse with the sizes and shapes

most used in your territory. And thirdly, he has built an efficient, qualified staff that swings into action on every order you place.

Serving you well is his first responsibility. At the same time he relieves you of concern over frozen investments, obsolete stocks, depreciation, non-paying storage space, and handling and insurance costs.

He's in business to keep you supplied. Call him SOON.



# NEWY YEAR WITH THESE START THE



# FULFLO BY-PASS OIL-RELIEF VALVES

Efficient plant management calls for a look into 1949 right NOW. And a look ahead will focus on these simple, economical, dependable valves.

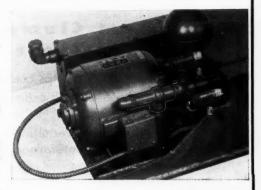
- CHATTERLESS.
- NO MAINTENANCE REQUIRED.
- INSTALLED EASILY.

Select required pressure from 5 springs.

Cast iron or bronze bodies: brass, hardened or stainless steel pistons.

For pressures from 0 lbs. to 350 lbs.

For pipe sizes 1/4" to 2".

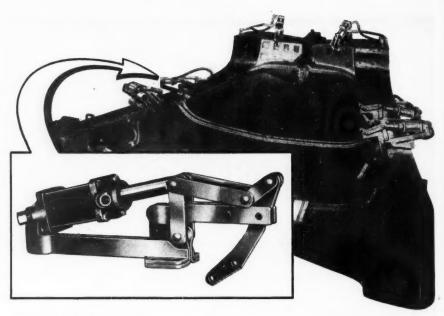


Write on your letterhead for FULFLO MECHANICAL DATA BOOK



Specialties Co., Inc.

BLANCHESTER, OHIO



## If You Must Clamp Under These Conditions:

- Hold work with many clamps controlled by a single valve
- In locations where use of ordinary clamps would prove inconvenient and impractical
- In multiple installations requiring sequence valves to operate various clamps at predetermined intervals

—then you'll definitely need this new Double-Acting Clamp Model DTAO-400 to do any of these jobs most efficiently.

Its holding pressure is 400 lbs., and operating pressure is 85 lbs.

The plier-like grip takes place between the toggle bar and the toggle jaw, no support required, and both members, in opening, swing wide to allow free removal of work.

Send for new brochure describing this and other new clamps.

KNU-VISE PRODUCTS

LAPEER MANUFACTURING CO. 3056 DAVISON ROAD . LAPEER, MICHIGAN

# ROLL

WATSON-FLAGG MODEL "C" PRECISION THREAD ROLLER



#### A VERSATILE MACHINE FOR THE WIDEST RANGE OF WORK

Extra-heavy frame gives rigidity to handle high hydraulic rolling pressures.

Open, accessible work area allows for a greater range of sizes and shapes.

Low die costs and simple set-up make runs as small as 1000 pay off.

Extreme flexibility of operation is assured by the available pressures and spindle speeds, permitting adjustments to accommodate wide variation in the four critical work factors: Hardness—Pitch—Diameter—Length of Thread.

PROFITABLE! On runs as small as 1000!

**HERE'S WHY:** Only two large rolling dies are used. Synchronization is quick and easy. Set-up time is measured in minutes.

Uniformity is automatically controlled — only spot checking is necessary—no operator skill required.

Send details on any thread or form rolling operation to Watson-Flagg, Paterson, New Jersey. Our engineering staff will tell you what to expect from the Model "C".

WATSON FLAGG MACHINE COMPANY, INC.

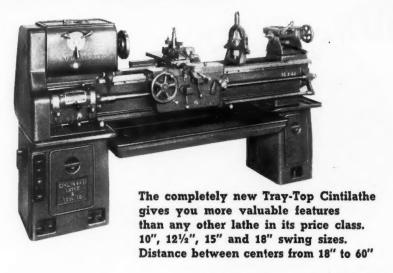




948

peed d an ing but at to

### GET MORE



### PAY LESS

Here are 10 practical reasons for making your next engine lathe a Tray Top: (1) Tray-Top on headstock and tailstock provides convenient "parking space" for tools. (2) 12 spindle speeds selected by color-coded dial, all geared transmission featuring flame hardened gears. (3) 48 thread and feed changes. (4) Unusually large spindles—rigidly mounted in precision anti-friction bearings—two on the 10" and 12½" size—three on the 15" and 18" size machines. (5) Double wall apron. (6) Totally enclosed change gear box. (7) Simple unique method of changing from English to Metric thread chasing or vice versa. (8) Enclosed electrical panel. (9) Optional drive, reversing motor control or multi-disc clutch and brake. (10) Cabinet legs . . . 15" and 18" sizes can be furnished with gap and gap block. WRITE FOR BULLETIN T-100.

CINCINNATI LATHE & TOOL CO.

cintilathe



This aluminum balance wheel is converted from while keeping the price of one of the best-known sewing machines in line.

Twenty-one operations are performed on a double index New Britain Model 98 Chucker. An excellent finish results and a tolerance of  $\pm$  .002 is held at two important points.

When a single machine can perform a wide variety of accurate cuts, eliminate all second operations and turn out finished pieces at a high rate . . . that's money-making production. You'll find it at its peak where fast, adaptable, accurate New Britain Automatic Screw Machines and Chuckers are at work. For other examples, write for New Britain's portfolio of actual Cost Histories, yours for the asking.

\*For details write for Bulletin 98.

### NEW BRITAIN

Automatics

THE NEW BRITAIN MACHINE COMPANY NEW BRITAIN-GRIDLEY MACHINE DIVISION NEW BRITAIN, CONNECTICUT

1248HG2



• The Eclipse trade-mark on end-cutting tools assures you many extra benefits. For 35 years Eclipse craftsmen have designed and produced the highest quality standard and special-purpose cutting tools for American industry. Our complete engineering service combined with the latest production equipment and modern plant, guarantee you tools properly designed and produced for long life. Why not send us production part prints for tool design and quotation?

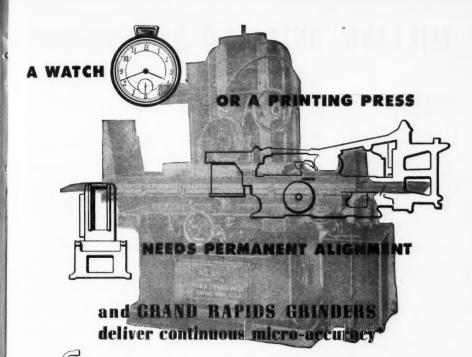


CUTTERS: Tungsten Carbide Tipped—Multi-diameter
—Inserted Blade—Center Cutting—Inverted and Down
Drive—Double End—End-Form—two-piece Core Drills.
HOLDERS: Stop Collar—Bushing Guided—Adjustable
length—Floating—Specials of all kinds.

Also complete stock of Standard Holders, Cutters and Pilots

3511753 COUNTAINONE CON

DETROIT 20, MICHIGAN



The micro-accuracy of Grand Rapids Grinders comes, in part, from Gallmeyer & Livingston's unique method of making massive, one-piece column and base castings of close-grained gray iron . . . achieving vibrationless rigidity and permanent alignment between cross-travel ways and vertical head ways.

Other assurances of long life accuracy in Grand Rapids Grinders include: patented vertical head adjustment; flanged type, pre-loaded ball bearing spindle; and the fastest longitudinal table speed in any grinder.

\* Accuracy within 0.00025 limits.

To serve you — Your inquiry concerning your specific grinding needs will receive prompt attention.

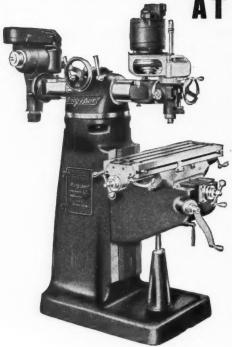
Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Grinders, Hand Feed Surface Grinders, and Combination Tap and Drill Grinders.



GRAND RAPIDS GRINDERS

308 STRAIGHT AVE., S.W., GRAND RAPIDS 4, MICHIGAN

### MILLING, DRILLING AND BORING AT ALL ANGLES

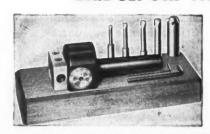


#### **OVER 10,000 IN USE**

You can use the Bridgeport Turret Milling Machine (with High Speed Attachment) for milling, drilling and boring at all angles, with maximum ease and convenience. It's a precision machine for production demands — accurate, sturdy, speedy, powerful.

The wide range and versatility of the Bridgeport Attachment enable it to serve as the complete central machine around which all operations revolve in many small shops. Features include: 15" diameter turret with 5" overarm, rugged construction, table, knee and saddle in convenient front-of-machine position, anti-friction bearings throughout, keyed overarm with worm wheel control for angular settings, large diameter graduated dials. Write for Bulletin.

#### BRIDGEPORT No. 1 BORING HEAD



Specially designed for Bridgeport Machines and Attachments but equally efficient on other machines. Diameter of head, 2½". Adjustment of slide, ½". Three holes for ½" diameter boring tools giving a range of more than 5". Complete with 5 boring tools and necessary wrenches.

WRITE FOR BULLETIN

#### BRIDGEPORT MACHINES, INC.

52 REMER STREET

BRIDGEPORT, CONN.







E

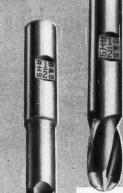
of le al a-S. 21 d die h 16

rt

er

e. r-

an







**NEW HANDY-SIZE CATALOG** 

describing important productionimproving features of all Brown & Sharpe End Mills together with complete specifications and prices. There's a Brown & Sharpe quality end mill to meet every end milling need. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

We wage buying through the Distributor

#### PRACTICALLY INDESTRUCTIBLE

#### **ACME BENCH VISES have ALL of these features**



Longer Vise Life **Maximum Gripping Power** 

No Side Twist or Wobbling

Unbreakable Sleeve Nuts Interchangeable Ground Jaws Swivel Bases

11 Sizes from 2" to 6"

Also ACME COMBINATION PIPE AND BENCH VISES with same outstanding features available in 31/2", 41/2" and 5" jaws.

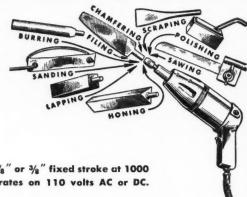
#### B-R-E-A-K

#### **Hand Finishing Bottlenecks**

with

#### ELECTRIC PORTABLE RECIPROCATING TOOLS

These handy tools will cut out many tedious hand filing and finishing operations -Increase Production Produce Uniform Work.



Light in weight — Delivers 1/8" or 3/8" fixed stroke at 1000 strokes per minute - Operates on 110 volts AC or DC.

Delivery from Stock



74

KR offer

every work

ner N Horice ample punch

tiple b весига

things

Great

it ano ter pr KRY

closed

o 100 operat

# SAVE 3 WAYS with a KRW 100-TON HYDRAULIC PRESS

SAVE MONEY
LOWER INITIAL AND
OPERATING COSTS

Hydraulic Presses offer multiple savings to every user and do better work in the bargain. Gardner Manufacturing Co. of Horicon, Wisc., says for example..."Our problem of punching sheets with multiple holes and keeping them accurate according to template has been solved with this press." Other manufacturers, after installing 100-Ton KRW Presses, say other things just as complimentary. Net of all these experiences is USERS SAVE MONEY, Reduce Costs, Make Greater Profits or, putting it another way, are able to outbid competition with better prices.

KRW Presses are highly flexible...they can be built with platen sizes up to 36" x 60", and can be gap, open or closed-end in type. Tonnage pressures can vary from 25

to 100 tons. Because they are hydraulically operated and not mechanically driven, they are quiet and vibrationless in operation.

SAVE WEAR WOMEN Gardner Manufacturing Co. of Horicon, Wisc., uses a 100-Ton KRW Hydraulic Blanking and Forming Press equipped with Wales-Strippit die to do multiple punching of battery charger panels and other

> They are equipped with automatic safety and operational controls. Platens can be stopped at any point in their travel.

START SAVING NOW! MAIL COUPON TODAY!

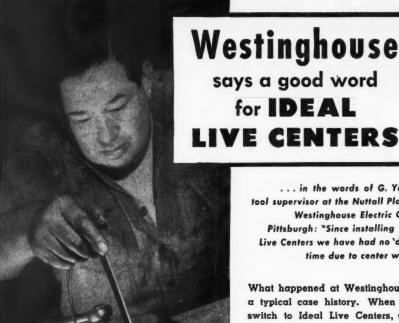
**K·R·WILSON** 

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

Please quote me prices and information on following type KRW Presses. Gap ☐ Open End ☐ Closed End ☐

Tonnage Reg..... Die Dimensions

....



... in the words of G. Young. tool supervisor at the Nuttall Plant of Westinghouse Electric Corp., Pittsburgh: "Since installing Ideal Live Centers we have had no 'down' time due to center wear."

What happened at Westinghouse is a typical case history. When they switch to Ideal Live Centers, users save from 20 to 50% and raise the quantity and quality of lathe output. They get deeper cuts at higher speeds with no burning of work or center. There's no friction-no grabbing-no gouging-no time loss on lubricating and grinding—less spoilage-more profit per man hour!

The Ideal "Multi-Duty" Live Center is available from stock with male, female, and pipe type inserts; also Heavy Duty Live Center, built to carry heavy loads-accurate to .0005. Ask for information and free demonstration today. IDEAL INDUS-TRIES, Inc., Sycamore, Ill.



AMERICA'S LEADING WHOLESALERS

Canadian Distributor: Irving Smith, Ltd., Montreal

76

# INCREASE MACHINE TOOL EFFICIENCY with



A real precision-built, leak-proof air valve that completely harnesses air power and assures split-second air control at all times. The easy-to-install Air Saver mounts in any position—operates at any angle—unaffected by vibration—provides ample air volume for operation of single or multiple jets. A natural where air is used for cleaning, drying, cooling, positioning or ejecting. Especially recommended around punch presses, die casting machinery, drill presses—and in reaming, broaching and other operations. Immediate Delivery.

Palmer Shile Co.
16022 FULLERTON AVE. DETROIT 27, MICH.

# Increase Your Output with Faster Setupsuse the efficient SHAPE-RITE SHAPER



• The 8" Hy-Duty Model Shaper, taking a full 8" cut, is unexcelled for tool and die makers and small instrument manufacturers.

#### FASTER SETUPS

SHAPE - RITE Shapers are engineered to provide faster set-ups . . . one of the most important elements for greater production. Maximum versatility, controls within easy reach, and many other built-in features cut set-up time to a minimum and eliminate many costly jigs.

In addition, there are other features such as speed and ease of operation . . . built-in accuracy . . . flexibility . . . dependability . . . and durability. The SHAPE-RITE SHAPER furnished with plain or swiveled table will take day-in and day-out capacity production and will increase output of precision work. A truly outstanding shaper for fast economical operation that you ought to investigate now!

SEE YOUR LOCAL DEALER OR WRITE DEPT. M-128



78



#### Grinding Wheel Grit . . . and ALL File!



Whether it be the skillful stoning of the countless teeth in these giant reduction gears or single-stroke passes on thousands of small machined parts — burring is a production operation — its cost, a production cost.

India Oilstone files, by Norton Abrasives, speed burring jobs — with a corresponding cut in production cost — for two reasons. They are made of aluminum oxide, grinding wheel abrasive, and they're all file — not just rows of cut teeth. They cut hardened steels as well as untreated, and permit easier control of stock removal.

Factory oil-filled for greater chip clearance, India Oilstone files offer Industry a complete size and shape range of over a hundred standard stock items with a finish spread including coarse, medium and fine grits. Ask your distributor or write for booklet, "Oilstone Files."

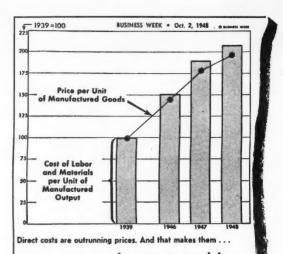
Photo courtesy of Westinghouse Electric Corp



BEHR-MANNING . TROY, N. Y.

QUALITY COATED ABRASIVES SINCE 1872

ALSO





Management's No. 1 Problem

Businessmen are baffled over how to pare costs when labor and material charges keep rising.

## When It Comes To Cost-Paring In Metals and Plastics Finishing...

— look into the opportunities offered by cost-saving Brightboy, with which you can frequently COMBINE CLEANING, BURRING, FINISHING, POLISHING, INTO ONE OPERATION!

Brightboy is achieving economies in an

IN ONE OPERATION

extensive variety of finishing operations because of the unique, "light" combination-action of its rubber and abrasive content. The soft rubber "cushions" the abrasive, giving positive, exacting precision control in close-tolerance work; simultaneously burring, cleaning, finishing, and frequently achieving the final polish. In many instances a single Brightboy production operation bridges all of the steps following the heavy grind right through the buff.

Be sure to ask your dealer to give you the Brightboy Catalog Manual. Our Service Department will be glad to offer methods-setup suggestions as well as to recommend solutions to specific jobproblems.

BRIGHTBOY INDUSTRIAL DIVISION

Weldon Roberts Rubber Co., Newark 7, N. J.



#### **NEW SMALL SIZES - NEW FEATURES**



#### NEW! No. 5R Rotary Model

Holds parts from 3/4" to 5" in diam. Control ring is operated from any position in which chuck stops.

The specific advantages of these new models, plus all the advantages of other B & S Permanent Magnet Chucks, permit increased efficiency in many operations. For sale only in the United States of America and its Territories.

Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.



#### NEW! No. 7R Rotary Model

Holds work from  $1\frac{3}{16}$ " to 7". Amount operating handle is turned permits variation of holding strength for accurate positioning of work.

#### NEW! No. 408 Rectangular Model

Has 4" x 8" working surface. Pole spacers closer than on other rectangular models, hold smaller pieces.



Has 4" x 12" working surface and two line pole spacers. Useful for grinding rows of small parts, as well as intermediate and large sizes.



We urge buying through the Distributor

BROWN & SHARPE BS



L IKE TWO LATHES IN ONE, the Lodge & Shipley Duomatic (automatic lathe) has twin tool carriages, front and back, operating singly or simultaneously . . . performing a wide variety of operations automatically. All the operator does is to load the workpiece, start the cycle and then remove the workpiece.

In the job illustrated above, turning an axle for a tractor, two taper cuts are taken at the same time, to halve taper turning time. Each of two tools cut half the distance on the taper, while additional tools turn the thread diameter, turn the bearing diameter, neck, face and chamfer. These multiple operations complete the piece in 1.8 minutes.

With two tool carriages, the Lodge & Shipley Duomatic naturally saves time in machining. Change-over time is cut sharply too, for there are no cams to change on the Duomatic. Lodge & Shipley Engineers will gladly explain these and other Duomatic features . . . show you how Duomatics can produce profitably for you.

### THE Lodge&Shipley COMPANY

CINCINNATI 25, OHIO

MACHINE TOOL DIVISION . 3055 COLERAIN

SPECIAL PRODUCTS DIVISION . 800 EVANS ST.

It takes more than "SAY-SO" to make a "BRALE" Diamond Indenter



As sole manufacturer of the genuine "ROCKWELL" Hardness Tester and originator of the universally accepted ROCKWELL Hardness scales, Wilson holds a deep responsibility. Every product bearing a Wilson name must have accuracy that approaches perfection. And "BRALE" is a Wilson name.

Remember, an inaccurate hardness test is worse than no test at all as it will pass defective material and reject good material. All the accuracy in your "ROCKWELL" Hardness Tester is lost if inferior penetrators are used. Keep in mind that one point of hardness on the Rockwell Scale represents a depth of only 0.00008".

WILSON

MECHANICAL INSTRUMENT CO., INC. AN ASSOCIATE COMPANY OF AMERICAN CHAIN & CABLE COMPANY, INC.

230-G Park Avenue, New York 17, N. Y.





#### Without a \$ of Capital Investment You Can Double Your Toolroom Capacity

If your toolroom is overloaded, don't expand; get in touch with the Taft-Peirce Contract Service Division.

Here at your immediate disposal are experience and facilities which have handled jobs ranging from complete tooling programs for automobile manufacturers to single jigs, fixtures, punches, dies, gages, and molds of the widest variety for manufacturers in almost every industry.

For complete information about this master toolroom and how it can become a part time part of your plant, write for a copy of the illustrated book, "Take It To Taft-Peirce." The Taft-Peirce Manufacturing Company, Woonsocket, Rhode Island.



#### TAKE IT TO TAFT-PEIRCE

For Engineering, Tooling, Contract Manufacturing



### ANOTHER OUTSTANDING PRESS ADDED TO THE FAMOUS ROUSSELLE LINE

**HIGH PRODUCTION** 

LOW COST

**DEPENDABLE** 

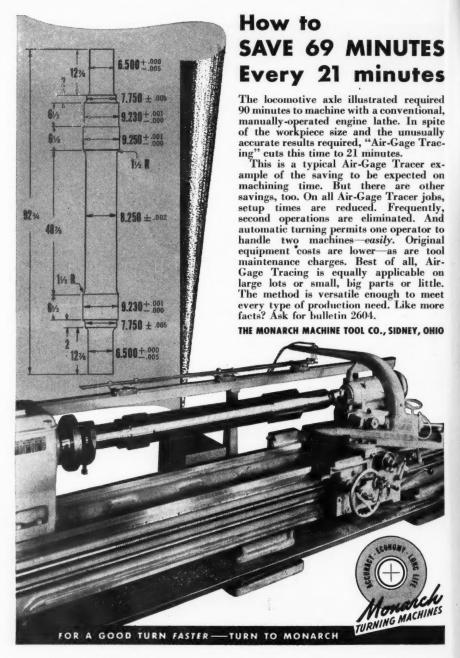
Ideal for sheet metal and fabricating shops. Punches to center of 36" sheets. Adaptable to trimming plastics, die castings and regular

punch press operations.
Other Presses: 5-10-15-25 ton
O.B.I. 15-25 ton horning with adjustable bed.

SEE YOUR LOCAL DEALER ROUSSELLF

WRITE DIRECTLY TO DEPT. AA

SERVICE AN HONOTHE CO.



### ENGINEERED

Rive Centers

Standard shanks with Morse tapers carried in stock send us your specifications and blueprints . we will see that your jab is set up with the right LIVE CENTER.

dl, e y

n

1 011

SHANK

SEAL SEAL

LARGE THRUST BEARING \_\_\_

LARGE RADIAL BEARING-

CUSHION ACTION -

GROUND TRUE with BEARINGS -

### STURDIMATIC TOOL COMPANY

5224 THIRD AVE. . DETROIT. 2 MICH.

# REASONS WHY MADISON REAMERS CUT TIME AND COSTS The simplified design and operational features of Madison Respuing Tools will enable you to cut your

The simplified design and operational features of Madison-Production Reaming Tools will enable you to cut your reaming time and hole costs to the minimum. Easy to reaming time and hole costs to the minimum. Easy to adjust, to maintain and always aligned, the free smooth cutting action of Madison Reamers has provided the answer to industry's need for greater speed and economy in reaming operations. Check the four reasons for Madison efficiency listed below.





#### MIRROR-SMOOTH FINISH

The cutting blades of a Madison Reamer produce a mirror-like finish that in most cases does not require an additional finishing operation. Since Madison cutters are pre-sized, any number may be stored in a crib. The Madison one-screw adjustment feature insures that both blades always cut, by eliminating possibility of unequal cutter blade expansion.



#### BETTER CHIP CLEARANCE

Because Madison Reamers have no multiple inserted blades, there is more room for thip clearance and circulation of coolant. Thus, danger of clogging and resultant overheating is eliminated, and shrinking or tapering of the hole prevented. Further insurance against hole distortion is provided by Madison's freer cutting action, which permits work to be held very lightly. This makes Madison Reamers ideally suited to the machining of the new, lightweight metals.



#### INTERCHANGEABILITY

Since Madison cutters are pre-sized, they are interchangeable in Madison bars. A sharp cutter can be inserted in a Madison bar in a matter of seconds without disturbing the original set-up. Keeping a sharp cutter in operation at all times assures more continuously uniform work and the holding of required tolerances. The two-bladed Madison cutter will naturally require less maintenance time.



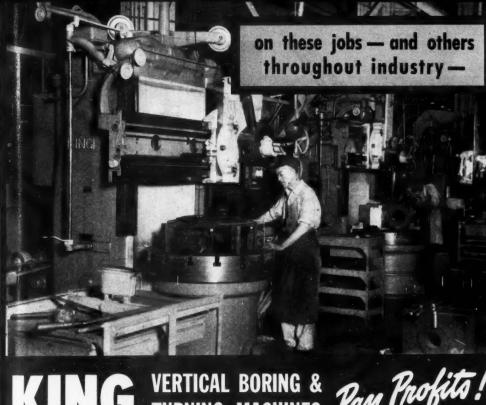
#### CONTROLLED FLOAT

Because the Madison cutter is floated in its bar at the exact point where the cutting action takes place, float can be better controlled and indicated for greater uniformity on long-time production jobs. Chances for bell mouth and bar wobbling are eliminated. No special floating tool holders and chucks are necessary.

#### MADISON

MANUFACTURING COMPANY DEFT. HM-2 HUSKEGON, MICHIGAN Madisons are used for rigid or float reaming on lathes, drills, millers and special machines. Used on hard and soft metals and plastics. Write for the Madison catalog—lists complete lines, prices and grinding instructions.





### VERTICAL BORING & Pay Profits!

Here are two 42" King Vertical Boring and Turning Machines busy turning out a wide range of production in one of the major shops of a prominent railroad. In addition to the cylinder head and crosshead shown being turned and bored, other jobs that are put on these versatile King machines include piston and cylinder plate castings, bearings, hub liners, cylinder bushings, boxes of all kinds, packing rings, and many other locomotive parts.

Throughout industry, King Vertical Boring and Turning Machines are kept busy all the time, for they have the built-in ability to take on a wide variety of jobs, and turn out the work fast, accurately, and at reduced costs. Modern machine tools are a sound investment. Consult a King engineer on your boring and turning requirements. It costs you nothing—and it can help you pave the way for substantial savings in easier, faster, and better production.

10 sizes - 30" to 144" swing - all available with or without side head. Write for complete specifications on the size machines that meet your work requirements.

American Steel Foundries

KING MACHINE TOOL DIVISION CINCINNATI 29, OHIO





FRONT MOUNT

No more accidents, no wasted combetter production with this to BENCHMASTER FRICTION ROLL FEED Hall stock—metal, wood, plastics, cardter, up to 3/16" thick, 3" wide. Feeds uniformly and accurately. Feed is adjustable from 0 to 3".

FRONT OR SIDE FEED. Bolts on either front or side of press for through or cross feed. Adjustable height aligns rolls level with die. Ideal for use on your Benchmaster and can also be adapted to most other presses.

High quality. Built to rigid Benchmaster standards assuring years of trouble-free service, Get yours today!

benchmaster

MANUFACTURING COMPANY

benchmaster tools

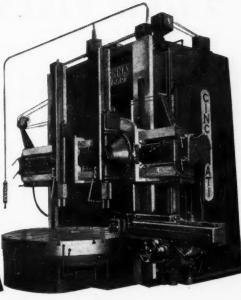
ORLD'S LARGEST PRODUCER OF SMALL PUNCH PRESSE

FINE INCREMENT SPEED CONTROL— Multi-point, fine increment motor rheostat controlled from operators position, eliminates compromise speed settings, inevitable with conventional gear changes. Exact cutting speed assures maximum production.

TAILORED TABLE SPEEDS—On work of varying diameter table speed may be continuously adjusted for maximum production, without stopping table, without shifting gears and while tools are cutting.

SET UP TIME REDUCED—Fine increment table inching control in forward and reverse directions with dynamic braking.

OPERATOR'S FATIGUE ELIMINATED —
Complete control of all motors from single accessible pendant station, plus absence of table clutch and brake shifting lessens operator's fatigue.



Effortless Control
COMES WITH
CINCINNATI
LIVERO
SPEED CONTROL

CAN NOW BE FURNISHED ON ALL HYPRO BORING MILLS IN FOLLOWING SIZES:

54'-64'-6'-7'.
7' widened to 8'. 8'-10'-12'
12'-16' Extension type.

Subsidiary of
Giddings & Lewis Machine Tool Co.,
Fond du Lac, Wis.

#### THE CINCINNATI HYPRO PLANER COMPANY

PLANERS - BORING MILLS - PLANER TYPE MILLERS

CINCINNATI, OHIO

### Send for Bulletin No. 44 describing these

#### 2 NEW VISES





#### SWIVEL-BASE

Finely and accurately made. Unique ADJUSTABLE ZERO POINTER. Vise removable from base, to use plain. Screw never protrudes under work, cannot be drilled into. Usable with Jig Attachments.





The famous Graham Vise that saves so much toolmaking cost by its special attachments. Three sizes to 124 lbs. for shaper, planer, drill press, radial, miller, grinder.



#### CENTERING

Centers work regardless of size variations, as both jaws move toward center. This gives double-fast action. Handle fits on either end.

#### "ADJUST-ANGLE" KNURL HOLDER

Straight Knurls Cut Many Patterns



With shank made to fit your turnet or tailstock, this Holder knurls work up to  $2\frac{1}{2}$ " dia. with a variety of patterns using only straight knurls.

GRAHAM MFG. CO., 30 Bridge St., East Greenwich, R. I.

### The More You Compare...



TS56B

Unless you have kept up-to-the-minute on the postwar developments in the new lighter, less inexpensive lathe field, you will be surprised at the tremendous advances in accuracy, capacity, speed, stamina and earning power that have been made in this field. You will also find, that the more you compare these new lathes, the more you will determine on

### SHELDC

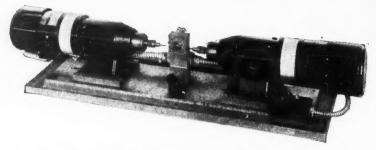


Write for New G-48 Catalog

- 1. Zero Precision Taper Roller Bearings most accurate made.
- 2. 13/8" hole thru spindle—1" collet capacity.
- 3. 111/4" Swing.
- 4. Spindle run out accuracy within .0005.
- Heavier carriage, wider bearing on bed.
- 6. 56" Bed held within .0005" of parallel alignment.
- 7. Reinforced steel cabinet bench with plate top.
- 8. Large double wall apron.
- 9. Standard big lathe controls.
- 10. Front Switch.
- 11. 8-speed, V-belt, enclosed underneath motor drive.

SHELDON MACHINE CO. Inc.

Manufacturers of Sheldon Precision Lathes . Milling Machines . Shapers 4250 N. KNO " VENUE . CHICAGO 41. ILLINOIS. U. S. A.



#### Automatically Tapping Two Opposed Holes Simultaneously

THIS 2-way bench fixture, which we recently designed and built, incorporates 2 Model "KT" Govro-Nelson Automatic Tapping Units which tap two opposed 8-32 holes simultaneously in a metal lamp part (shown on base).

When the part is located by the operator, it actuates a microswitch, causing both Units to tap simultaneously. Tapping time: One second. Output: As high as 1800 per hour, depending upon operator efficiency.

If you have similar operations, send samples and part prints and we shall be pleased to recommend the proper Automatic Units or quote on a complete set-up. Literature sent upon request.



#### GOVRO-NELSON CO. Machinists of Precision Parts

for 25 Years
1933 Antoinette, Detroit 8, Mich.

Automatic DRILLING UNIT

TOO COSTLY
FOR YOUR REAMING JOBS?

NOT with

Staples CARBIDE-

**ECONOCUT** REAMERS!

Now the advantages of carbide reaming—greatly increased tool life, finer hole finish, greater production—are available for your reaming jobs at still greater reduction in tool costs — with Staples ECONOCUT Reamers.

These are precision tools. ECONOCUT
Reamers have diamond lapped cutting
edges, and standard tolerance of .0005"
is held on diameter. However, these
record low prices are made possible by
standardizing ECONOCUT on straight
shank, straight flute tools, in the most
widely used size range.

Hundreds of shops, large and small, are now showing considerable savings through ECONOCUT reaming. You will too. See your Staples distributor, or order direct. ECONOCUT Reamers are available for immediate delivery in the sizes and at the prices shown in the table at right.

THE STAPLES TOOL COMPANY
CINCINNATI 25, OHIO



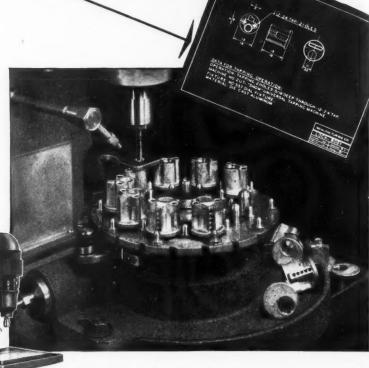
Diam.	Tip Length	No. of Flutes	Shank Diam.	Over- all Length	PRICE
1/4"	1/2"	4	15/64"	6"	\$3.75 ea.
9/32	1/2	4	15/64	6	4.00
5/16	1/2	4	9/32	6	4.00
11/32	11/16	4	9/32	6	4.25
3/8	11/16	4	5/16	7	4.25
13/32	11/16	4	5/16	7	4.75
7/16	11/16	4	3/8	7	4.75
15/32	1	4	3/8	7	5.00
1/2	1	6	7/16	8	5.50
17/32	1	6	7/16	8	5.75
9/16	1	6	7/16	8	5.75
19/32	1	6	7/16	8	6.25
5/8	1	6	9/16	9	6.25
NOT	E. For to	nor cho	nk roqui	romonto	1100

NOTE: For taper shank requirements, use standard split sleeve reamer driver. Available at moderate price.

#### Staples CARBIDE-TIPPED CUTTING TOOLS

A COMPLETE LINE OF SINGLE AND MULTIPLE POINT CUTTING TOOLS EXPANSION REAMERS - FORM TOOLS - CENTERS - MASONRY DRILLS - SPECIAL TOOLS

#### SNOW FULL UNIVERSAL TAPPING MACHINE



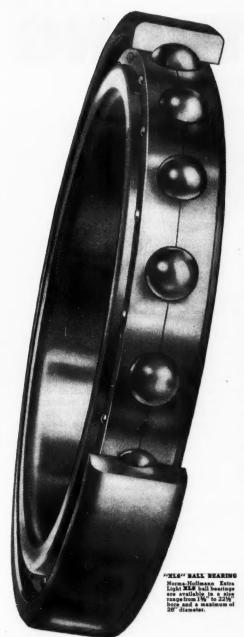
The SNOW Full Universal Tapping Machine is complete with electric controls, motor driven lubricant pump, air operated table lift, and dirt and moisture trap.

All types of air operated indexing and clamping fixtures and jigs can be instantly synchronized with the cycle of the machine. The electric controls provide various types of operation to suit any specific tapping problem. Extreme sensitivity in the application of power eliminates tap breakage, and allows class 3 and 4 fits to be obtained at no loss in production.

Years of experience and thousands of installations enable us to assist you in any of your tapping requirements. Submit blue prints and sample parts for specific recommendations, production estimates, and tooling data.



443 EASTERN AVE., BELLWOOD, ILL. . SUBURB OF CHICAGO





#### NORMA-HOFFMANN

EXTRA LIGHT XLS SERIES

### Precision Bearings Provide greater latitude in designs

These Norma-Hoffmann Extra Light Precision Ball Bearings—XLS types—provide the solution to cramped bearing space in machine design. In addition to the advantages of low friction, compactness and light weight, the abnormally large bores, compared to outside diameter, give designers greater latitude in designs of their equipment. They are also suitable for combined radial and thrust loads in either direction. Investigate Norma-Hoffmann Extra-Light Precision Bearings for your designs. Our Field Engineers will gladly aid you in the application and selection of the proper bearing for your particular designs. Write for their services and catalog.

NORMA-HOFFMANN
Precision BEARINGS

NORMA-HOFFMANN BEARINGS CORPORATION

FIELD OFFICES: New York, Chicago, Cleveland, Detroit-Pittsburgh, Cincinnati, Los Angeles, San Francisco, Portland, Ore., Seattle, Phoenix.



#### ARMSTRONG TOOL HOLDERS

are more efficient

It takes years of development, improvement and practical experience to create and perfect a line of tools. This has been the specialized work of ARMSTRONG, a contribution to machining efficiency which they have carried on continuously for 59 years.

Starting with the Armstrong Principle of inserted cutters in permanent tool shanks that "Saves: all Forging, 70% Grinding and 90% High Speed Steel," they created this unique method of tooling which has

changed shop practice in over 96% of the machine shops and tool rooms. And, today, in a specially built plant, equipped with every modern facility and staffed with experts in each phase of tool making, this work goes on.

To you, as a tool user, here is always one safe principle — specify ARMSTRONG TOOL HOLDERS for every operation on lathes, planers, slotters and shapers, for turret lathes and screw machines. They are catalogued and stocked by all leading supply houses.

#### ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5228 W. ARMSTRONG AVENUE

CHICAGO 30, U. S. A.

Eastern Warehouse and Sales: 199 Lafayette St., New York 12, N. Y. Pacific Coast Whse. and Sales Office: 1275 Mission St., San Francisco 3, Calif.



# Machine Shop

DECEMBER, 1948

Vol. 21, No. 7

CINCINNATI, OHIO

#### This Month

For the feature article this month, Mr. E. C. Helfrich, Research Engineer of the Cincinnati Milling Machine Company, presents data based on experimental evidence obtained on the crush dressing process which has been compiled for the purpose of providing a clearer understanding of the process to all who may be interested in it. Especially helpful to the engineer who may be called upon to apply the crush dressing process are the forces involved, power requirements, rate of wheel removal, and the effect of wheel and crusher diameters and surface speed.

James Clyde Porter discusses the problems which arise when the speed of machining operations is increased beyond normal production speeds in his article "Coolant Temperature Control Permits Faster Machining Operations." Mr. Porter describes the application of cooling units which are designed to aid in the dissipation of the heat

which is generated in high speed machining operations. Page 110.

C. W. Hinman presents the tenth in his series of articles on Progressive Die Design. In this article he describes the design and operation of a die for producing right and left-hand plier handles and also a segmental die for blanking and forming blank segments which are used for terminals in automatic telephone switchboards. Page 120.

Manufacturers who have already installed air conditioning equipment in their plants as well as those who contemplate the installation of such equipment will find valuable information in Mr. F. Honerkamp's article "Air Diffusion as an Aid in Precision Manufacturing Operations." Page 134.

A pictorial presentation showing the more important operations involved in overhauling a huge turbine can be found on page 156. Under the title of "Todd Overhauls Huge Turbine," this article illustrates the various machining operations which were

required to recondition a 35,000 K.W. turbine casing and exhaust chamber.

An unusually fine collection of job stories which describe the manner in which the application of new tools and equipment enables manufacturers to obtain higher production and more accurately finished work is presented in "Modern Equipment at

Work," page 158.

The "Ideas from Readers" section beginning on page 182 presents the usual assortment of "homemade" tools and devices. Incidentally, if there is a "kink" or short cut in use in your shop, send us a description of it. We will pay for each idea that is published.

"Over the Editor's Desk" appears on page 350.

### Important Facts on Crush Dressing of Grinding Wheels

By E. C. HELFRICH

Research Department, The Cincinnati Milling Machine Company

TATITHIN the past decade the ancient art of crush dressing grinding wheels has been improved and applied to a variety of precision grinding operations in the modern machine shop. At present crush dressing is rapidly finding its place as a valuable tool in industry. Crush dressing has the advantages of providing cool grinding and less normal force, plus its adaptability to the process of dressing intricate forms in the wheel surface. Vitrified grinding wheels lend themselves readily to crush dressing, and are, in fact, the only type to which this process has yet been applied successfully in commercial practice.

#### Theory of Crush Dressing

The abrasive grains in a grinding wheel are arranged in much the same manner as the atoms in a crystalline material. These grains are held in place by the bond which may be compared to the forces holding the atoms in place in a crystalline solid. Between the grains are voids which might be compared to the empty space existing between atoms in a crystal.

In the manufacture of grinding wheels, the grains, (excluding special mixtures) are maintained approxi-

mately equal in size by screening. The strength of the bond between grains is determined by the ratio of bond material to grit material, and is maintained as uniform as possible by a thorough mixing of ingredients. The voids are produced by putting particles of an organic material into the mix which burns out when the wheel is fired. The extent to which a grinding wheel measures up to the ideal, that is, grains uniform, bonds of equal strength, and uniform spacing, depends upon the excellence of the manufacturing process.

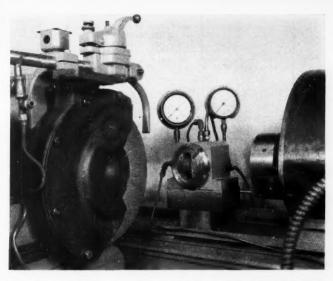
In view of this analogy, one might suspect that the material of which a vitrified grinding wheel is composed will have many of the properties of a crystalline solid. This leads at once to the fundamental assumption of the theory of crush dressing, namely, that a definite pressure (force per unit area) must be applied to the grinding wheel by the crush dresser to overcome the resistance to penetration: that is, the grinding wheel structure exhibits a definite "crushing pressure." In other words, if the voids have sufficient volume to accommodate the grains as they are pushed inward, and the average force to dislodge each individual

Fig. 1 — Experimental Crush Dresser Mounted on Table of Centertype Grinder.

grain is constant throughout a given grinding wheel, the ultimate pressure that the wheel will support is equal to the product of that force times the number of grains per unit area. Assuming the structure to be uniform

throughout, this ultimate crushing pressure may be considered to be a constant for a given wheel. Actually this has been found by experiment to be the case—the pressure (force per unit area of contact) between crush dresser and wheel has been found to be essentially a constant for a given wheel.

In crush dressing, the force is normal to the wheel surface and consequently the grains are pushed inward as they are detached from the wheel. As they are pushed inward they must have some place to go, that is, the voids must be large enough to accommodate the grains until the crusher passes by, at which time the coolant should wash the detached grains from the wheel surface. If the voids are too small many grains will undoubtedly be wedged tightly into the wheel structure. Experiment indicates that this is the case, particularly for larger values of penetration of the crush dresser into the wheel, which causes the grains to be pushed inward greater distances. If the voids are filled in the above manner, the crushing pressure will be increased because the individual



grains encounter greater resistance to movement when detached from the wheel structure.

The way in which the system adjusts itself to this constant pressure is readily appreciated if it is borne in mind that the arc of contact increases as the penetration of the crush dresser into the grinding wheel increases. When a certain force is applied to the dresser the penetration increases until the area of contact is large enough so that the pressure is equal to the "crushing pressure", that is, the maximum pressure that the wheel will support without further penetration. Therefore, during crush dressing the stress existing between the crush dreser and grinding wheel remains equal to the crushing pressure of the given grinding wheel.

#### Discussion of Data

Figure 1 shows a view of the crush dresser and grinding wheel setup used for obtaining crush dressing data in the research department of the Cincinnati Milling Machine Co. Figure 2 is a plot of the crushing pressure versus the normal force on the crush

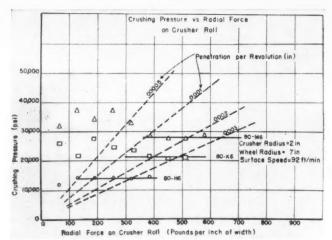


Fig. 2—Crushing Pressure versus Radial Force on Crusher Roll for Three 80 grain size grinding wheels, Graded H6, K6, and M6

dresser for three 80 grit wheels, which are graded H, K, and M by the manufacturer. Superimposed on these curves are the dotted constant penetration lines, showing the variation in the penetration per revolution. It can be seen at a glance that the crushing pressure fulfills the theoretical assumption in that it appears to have a constant value between a range in penetration of from 0.0001 inch to 0.0003 inch per revolution of the grinding wheel. It turns out that for values of the penetration less than 0.0001 inch per revolution, the length of the arc of contact is equal to or less than the average spacing between the grains in these wheels. In view of this, the fact that the crushing pressure is somewhat erratic in this range is not hard to understand. It would undoubtedly be advantageous to control the penetration or the crushing force during a crush dressing operation so as to remain in the range where the crushing pressure is constant. We might conclude, therefore, that for the purpose of engineering calculations, the crushing pressure is constant in the useful range for these wheels.

Since wheels of fine grain size are

usually recommended for crush dressing applications, a 120 K and a 180 I wheel were tested. This data is presented in Fig. 3. The value of the

t

i

C

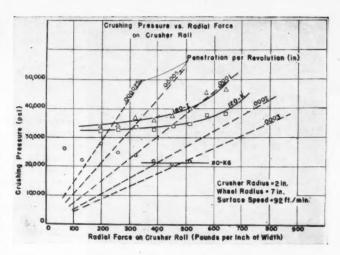
crushing pressure appears to increase gradually throughout a range of penetration of from 0.000025 to 0.00015 inch per revolution for the 120 K wheel. For the 180 I wheel, the pressure appears to increase slowly from 0.000025 to 0.0001 inch penetration per revolution. If an average value is taken for the crushing pressure between these ranges and for these wheels, we could assume it to be a constant without introducing an error larger than 5 per cent. For penetrations larger than 0.00015 inch for the 120 wheel, and 0.0001 inch per revolution for the 180 wheel, the crushing pressure increases at a greater rate. Thus it appears that if we exceed a certain rate of crush dressing for a given wheel, the voids are too small to accommodate the material removed until it has a chance to be washed away by the coolant. One would also expect that as the penetration and amount of the material removed increases, a portion of the crushed material is wedged into the voids so tightly that it is not removed by the coolant after the crusher has passed by. This would be undesirable from the standpoint of grinding practice, and therefore, it would be advisable not to exceed those rates

Fig. 3—Crushing Pressure versus Radial Force on Crusher Roll for an 80-K6, 120-K, and 180-I Grinding Wheel.

of penetration for which the crushing pressure approximates a constant. When a Brinell hardness test is performed on the side of these grinding wheels, the mean pressure

supporting the ball is found to be from 1.5 to 3 times the crushing pressure as determined in these tests. Examining the spherical seat it is found that the crushed material has been pushed ahead of the ball, and pressed into the voids, thus forming a solid supporting surface. However, when crush dressing, the penetration per revolution of the crusher into the wheel is of the order of 0.0001 inch whereas in a Brinell hardness test (500 kg. load), the total penetration is in the neighborhood of 0.030 inch, 300 times that incurred in crush dressing, the wheel would make 300 revolutions and the crushed bond and grit material would be removed between each successive pass of the dresser over the same portion of the grinding wheel surface.

It is not surprising to find that consistent values of the crushing pressure are obtained at smaller rates of penetration for the 120 and 180 grit wheels than for the 80 grit wheels since the number of grains per unit area has been increased, and the distances between grains and size of voids has been correspondingly decreased in going from the larger to smaller grain sizes.



#### Results of Tests as Applied to Crush Dressing Practice

A number of grinding wheel faults were observed during the author's experience with crush dressing. Wheels are often found to be harder and stronger in some parts than in others. For example, a wheel may be harder on one side than the other, resulting in an unequal force distribution across the face of the crush dresser and an unwanted taper in the crush dressed surface due to deflection. A more general fault is the variation in hardness from point to point around the periphery of the wheel. All wheels tested seemed to have this fault to some extent although in general the finer grit wheels seem to be of a more uniform structure than the coarse wheels. This fault produces an out of roundness which is objectionable as it will cause chatter and poor finish. Thus, the general application of the crush dressing process for precision grinding would seem to be limited in part by lack of homogeneity in grinding wheel structure. These results may be due in part to the author's use of resilient loading of the crush dresser (in order to permit measurements of force and pene-



Fig. 4—Photomicrograph (64X) of Typical Faxfilm Replica of the 180-I Grinding Wheel Surface when Diamond Trued.

tration) plus a low wheel speed, which allowed the dresser to "follow" the wheel surface. A more rigid dresser mounting should minimize the effects due to non-uniformity of wheel structure.

The structure of a crush dressed wheel is more open than a diamond trued wheel, with larger voids (and consequently a smaller number of grains) in prominence. (See Figs. 4 and 5). This can be observed by eye or by making Faxfilm impressions of the wheel surface, which can be studied with a microscope. A special technique was employed in making the Faxfilm (plastic) impressions illustrated in Fig. 4 and 5. Instead of the usual procedure of applying the solvent to the surface which is to be studied, and pressing the Faxfilm down with thumb or roller, the solvent in this case was placed on the plastic ribbon which was held against the wheel surface with a flexible strip. The above procedure was used so that only the high spots in the wheel surface (grains that would normally contact the work when grinding) would contribute to the impression. Microscopic

examination of the Faxfilm impressions also showed that a considerable number of grains were loosened (without being removed) by the crush dressing process, whereas in diamond dressing very few grains were loosened without being completely removed.

There is considerable evidence that crush dressing produces sharp edges on the grains. This conclusion can be interpreted

scientifically if we think of the grains being split along cleavage planes just as in the "cutting" of gems. For example, the ruby has the same composition and crystal structure as aluminum oxide abrasive grains, with the exception of impurities which determine the color. Aluminum oxide (corundum) crystals are hexagonal and are described as having almost perfect cleavage parallel to the base and faces of the unit rhombohedron. Thus, there are eight directions in which aluminum oxide crystals may cleave or split. Therefore, if a thrust is applied to the tip of an abrasive grain imbedded in a grinding wheel, a portion of the grain may be split off along that cleavage plane which is subjected to the maximum unit stress. Since the thrust is approximately normal to the surface in crush dressing, the new surfaces produced on the grains will be inclined at a considerable angle to the wheel surface.

Two advantages of crush dressing that can be demonstrated are cooler grinding and less normal force for a given rate of metal removal. Cooler



### OPERATION TELEVISION...

This television chassis, a modern product made in the modern manner on a Cincinnati Press Brake, is produced from blank to completion in one stroke—four simultaneous operations on one machine.

281 holes, tabs and notches are punched, and three sides are formed at each stroke—to close tolerances.

Cincinnati wide beds and rams—either fixed or detachable—for large area work, are highly productive on jobs of this kind.

You may find you can do it for less on a Cincinnati Press Brake.



Photos-Courtesy Rex Engineering Co., Cincinnati, O.

Write for technical Bulletin 145, a compact treatise on Press Brake practice, dies and applications.





S

s.e.s.h

0

-

f

n

g

e

n

-

n

d el

r

18

THE CINCINNATI SHAPER CO.

CINCINNATI 25, DHIO U.S.A. SHAPERS SHEARS BRAKES



Fig. 5—Photomicrograph (64X) of Typical Faxfilm Replica of the 180-I Grinding Wheel Surface when Crush Dressed.

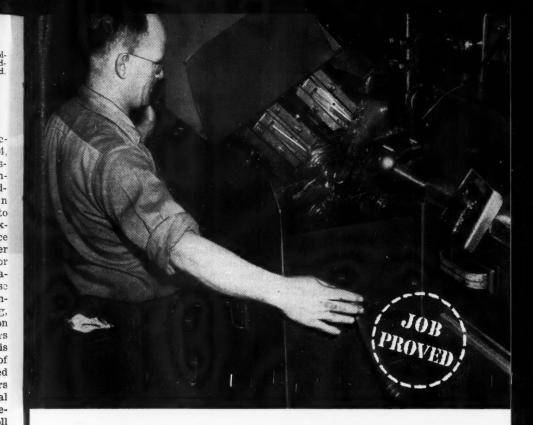
during grinding.

Recommendations made in recent articles Sec. 1, 2, 3, and 4, in Bibliography on crush dressing, differ in detail, but in general agree on many recommended practices. Regular grain grinding wheels are preferred to those containing special mixtures. Grinding wheel surface speeds up to 300-350 feet per minute are recommended for crush dressing. Where the machine is equipped for the use of a cutting fluid, this is gen-

erally used during crush dressing, whereas compressed air is used on machines such as surface grinders when no cutting fluid system is provided. The principal function of the fluid is the removal of detached grits, although certain other factors also appear to be involved. Helical gashes, unequally spaced, are sometimes machined into the crusher roll to facilitate the removal of detached grits when a deep form is being dressed into the wheel. Crusher rolls are usually made of hardened high speed steel although other materials are frequently used. In the author's experience crusher roll wear was not appreciable when the grinding wheel was allowed to drive the roll, however, noticeable wear was encountered (especially in starting) when the crusher roll was made to drive the grinding wheel.

At present the process of crush dressing is an art. To do satisfactory work the machine operator must be thoroughly familiar with the limitations of his machine, and also have an insight into the nature of crush dressing. To the author's knowledge very

grinding depends on the larger voids, increased chip clearance, and better application of the coolant; plus the elimination of rubbing between work and flank of tool (abrasive grain) which would undoubtedly be present with tangential flats on the tips of the grains. Crush dressing may, therefore, be used as a means for eliminating overheating of the work surface during grinding. Less normal force is understandable because of the sharper grains which by virtue of their sharpness require less force to penetrate the workpiece. Crush dressing is, therefore, helpful when grinding a fragile workpiece between centers: normally in such a case the deflection produced by a dull wheel may result in chatter and lack of straightness. Previous tests made by the author in which the ratio of tangential to normal grinding force was studied revealed that, in general, higher ratios of tangential to normal force were obtained (during grinding) with a crush dressed wheel. A high ratio of tangential to normal grinding force was found to be indicative of more efficient metal removal and less heating of the work



# ONE OIL DOES TWO JOBS

# One New Sunicut Grade with Petrofac\* Replaces Two Oils, Gives Improved Performance and Lowers Costs

Part: Knurled rise nuts for 14" and 18" Stillson wrenches

Operation: Spot. drill, knurl, and cut off Machines: New Britain Model 61's

Materials: SAE X1112 and X1113 Bar Stock

Tools: Rex AA High-Speed Tool Steel Cutting Speed: 156 S.F.P.M.

d

3e.

d

9i-

9-

S

r,

3-

r

g

h

e

3-

18

Cycle Time: 9.9 seconds

Production: 363 pieces per hour per machine

A manufacturer of wrenches was using two oils in his automatic screw machines -- a dark cutting oil and a lubricating oil. Replacing both with one grade of new Sunicut with Petrofac, he found the way to many benefits. Savings have been substantial. Dilution of cutting oil through seepage \*Petrofac is a trademark of Sun Oil Company

is no longer possible. Drain-off from chips is increased. There is only one oil to buy, store and handle. Finish is better, tool life longer, work visibility improved.

The new Sunicut grades with Petrofac possess superior metal-wetting, antiweld and extreme-pressure qualities. They are not blended with animal or vegetable fatty oils-cannot turn rancid. For more information write for folder MM-12.

## SUN OIL COMPANY · Philadelphia 3, Pa.

In Canada: Sun Oil Company, Ltd.

Toronto and Montreal

PETROLEUM PRODUCTS DESUNCCOED



little information has been published concerning the basic principles of the crush dressing process. It is hoped that this discussion will serve to stimulate interest in crush dressing and serve as a basis for further development of the subject.

**BIBLIOGRAPHY** 

"Crushed Wheel Grinding," by J. C. Wilson, Tool Engineer, vol. 17, Dec. 1946, pp. 35-39.
 "Dressing Grinding Wheels," by W. Fay Aller, Mechanical Engineering, vol. 66, Dec.

1944, pp. 779-782.
3. "Crush Dressing of Grinding Wheels," by

8. Y. Moss, Mechanical Engineering, vol. 68, Oct. 1946, pp. 885-888.
4. "Comparison of Crush Dressing and Diamond Dressing," by E. V. Flanders, Mechanical Engineering, vol. 69, Feb. 1947, pp. 123-127.

## "A More Glorious Edifice than Greece or Rome Ever Saw"

In his matchless eulogy on General Washington in 1832, Daniel Webster closed with the words quoted below. Now, 116 years later, when we must defend our heritage against "enemies foreign and domestic," we bring them respectfully to your attention.

THER misfortunes may be borne, or their effects overcome. If disastrous wars should sweep our commerce from the ocean, another generation may renew it; if it exhaust our treasury, future industry may replenish it; if it desolate and lay waste our fields, still, under a new cultivation, they will grow green again, and ripen to future harvests.

"It were but a trifle even if the walls of yonder Capitol were to crumble, if its lofty pillars should fall, and its gorgeous decorations be all covered by the dust of the valley. All these may be rebuilt.

"But who shall reconstruct the fabric of demolished government?

"Who shall rear again the well-portioned columns of constitutional liberty?

"Who shall frame together the skillful architecture which unites national sovereignty with State rights, individual security, and Public prosperity?

"No, if these columns fall, they will be raised not again. Like the Coliseum and the Parthenon, they will be destined to a mournful and a melancholy immortality. Bitterer tears, however, will flow over them than were ever shed over the monuments of Roman or Grecian art: for they will be the monuments of a more glorious edifice than Greece or Rome ever saw. the edifice of constitutional American libberty."

#### No Future!

If we have any bricks to be laid, we're not going to lay them in New York where a state court has just upheld an arbitrator's award giving bricklayers a daily wage of \$27.

It's not that we think \$27 is too much to make in one day, although we can think of a lot of bank presidents who would like to get that much. What depresses us is the futility of trying to cut in on this racket.

At first we raised our boy with the idea that he would become President of the United States, or barring some slight slip-up there, at least head of General Motors, or maybe even a famous surgeon. Or even lower, possibly an editor.

Then we got reading about bricklayers' wages and went right out and bought the kid a trowel. We were even willing to help carry the hod for him.

But, we found, it's no use. Apprenticeships are non-existent in the bricklayers union unless you have a pull or are a relative of a union pork chopper. With a fine understanding of the law of supply and demand, the union czars have a monopoly for themselves. Lots of people want bricks laid; by trimming down the labor supply and limiting the number of bricks that can be laid in one day, the bricklayer increases the demand for his services to such an extent that people will pay him \$27 a day in desperation. Naturally, he isn't going to let anybody horn in on a nice thing like that. Just a dirty Wall Streeter, that's what he is.

So it looks as if Junior will just have to be a corporation president after all. Poor kid! No future!! -Detroit Free Press



# High Production

All geared, sturdy, accurate and versatile, furnished in 21", 24", 28" sizes. Built in both box type and round type to suit the particular need.



Direct Drive, with push button control of motor—in 21", 24" or 28" sizes. Simplified for low cost production, yet adaptable and convenient.

Opportunity of selection means increased value to the buyer—the power to select exactly the machine suited to the particular job.

Cincinnati Super Service Upright Drills are built in production, and all geared types one for high production, and on the other, versatility of performance.

Both types of these modern, up-to-date upright drills are sturdy, fast and rigid. They give long, trouble-free performance, and assure the user "low cost per hole."

Write for bulletin U-27 (Direct Drive Production Super Service Uprights) and bulletin U-25 (All Geared Super Service Uprights).



Equal Efficiency of Every Unit Makes the Balanced Machine

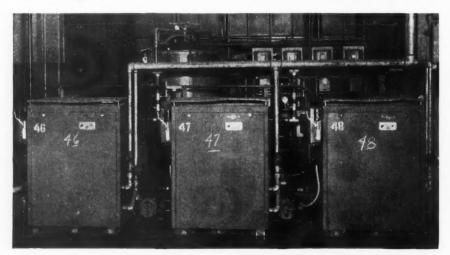
THE CINCINNATI BICKFORD TOOL CO. cincinnati 9. Onio U.S.A.

# Coolant Temperature Control Permits Faster Machining Operations

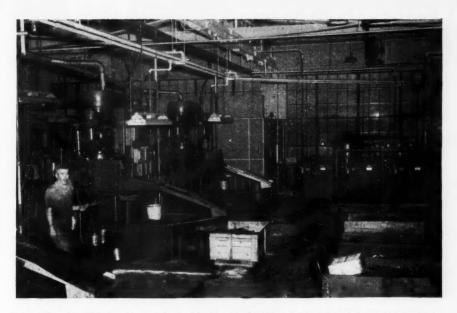
By JAMES CLYDE PORTER

WHEN higher operating speeds than those normally recommended for a particular machining operation are used in order to increase production it is inevitable that the problem of dissipating the heat which is generated at the point of contact of the tool with the work is greatly magnified. The excessive heat thus produced may result in loss in hardness of the tool edge, a welding action between tool and chip, or both.

Under ideal or normal working conditions the coolant will aid in dissipating the heat which is generated by the cutting action of the tool. But as the operations are speeded up, greater heat is generated at the point of contact of the tool with the work and this heat is immediately absorbed by the coolant, thereby causing the coolant temperature to rise above normal working conditions. In this process the effectiveness of the coolant is reduced



The Three Airtemp Units Shown Here are used to Maintain Coolant at Constant Temperature



View Showing Grinder Line at Left which is Supplied by Coolant Piped from Airtemp Units at Right Rear.

since the ability of the coolant to carry off the heat is lessened as the temperature of the coolant is increased.

In the past, when this condition prevailed, either of two courses of action have been available. The first and better plan was to reduce the speed of the operations until both coolant and tools were again at a proper working temperature and at which time operations could be carried out with a minimum number of rejects. But this method has afforded only temporary relief if the operations were again speeded up. The other plan was to continue to operate at high speed with an ever increasing percentage of rejects. Neither of these plans offered much relief; certainly no permanent relief.

The solution to the problem has been found in the development of a selfcontained cooling unit that operates automatically with the machine in operation and removes the excess heat from the coolants, thereby eliminating the problem of rises in temperature of both the coolant and the work.

Before the problem was finally solved by means of the cooling unit other methods were tried in various plants. For instance, coolants of higher viscosity were used, thereby solving some of the problems but imposing a new problem—that of separation of the cuttings from the higher viscosity coolants were used the cuttings washed off by the coolants remained in suspension and made cleaning of the coolants a much more difficult operation.

Engineers and others working on the problem finally summed up the entire problem by concluding that the limit of any machine tool to produce within allowable tolerances is in direct ratio to the extent to which the heat generated in the operation could be dissipated. When this axiom had been evolved it became quite clear to those working on the solution of the problem that heat dissipation could only be accomplished by controlling the temperature of the coolant. From this point on it was simply a case of applying cooling unit technique to the coolant.

The solving of this problem by the use of cooling units to reduce the temperature of the coolant has produced a technique whereby machining operations may be speeded up without increasing the number of rejects. The result of this development has been twofold. In the first place the volume of production has been maintained at the maximum level. In the second place production costs have been very materially reduced because the maximum production per machine man-hour has been nearly if not quite 100 per cent maintained through the elimination of rejects.

A very good example of what can be accomplished by the use of refrigerated coolant on high speed machining operations may be found in the plant of an eastern manufacturing company, which firm installed three Chrysler Airtemp PL 300 Package Liquid Cooler units.

This company manufactures piston rings. The firm uses a battery of three Besly grinders in which the cast iron piston rings are passed continuously between two stones where both the top and bottom surfaces are ground in one operation. These three Besly grinders are identical, each machine operating independent of the other two.

The firm was using Almag coolant which worked to perfection until the speed of the grinding operation was increased. The piston rings had to be held to within 0.0003 inch, which tolerance was easily maintained so long as the coolant was held at its proper working temperature. During the early part of the working day the output of the three grinders was satis-

factory with practically no rejects but as operations continued the coolant became heated by the friction generated by the grinders above the satisfactory working temperature and the rings would swell, thereby causing breakage.

The Chrysler Airtemp engineering department was brought into the picture and went to work on the problem. Upon their recommendation three Chrysler Airtemp PL 300 Package Liquid Cooler units were installed. Each of these units is a self-contained unit with the exception of a coolant pump which is located outside of the packaged unit. This pump, used to circulate the coolant, is placed either at the base of the machine or attached externally to the coolant tank. These units are located away from the machines they serve and the coolant is piped to each machine served. The addition of such a cooling unit to a machine does not interfere in any way with the machine tool construction, the machine piping or the electrical circuit.

In the plant under discussion the three cooling units were set up to work in sequence, which is the recommendation of the Chrysler engineers. The operation is entirely automatic, one cooler going into operation when one or more grinders are operating. When the temperature of the coolant rises above a predetermined degree, the second cooling unit automatically goes into operation and when the coolant temperature again rises, the third unit starts functioning.

Conversely, when the temperature drops to within a predetermined degree, one unit cuts out automatically and if the coolant again drops the second unit will cut out. Each unit furnishes three tons of refrigeration and handles 30 gallons of coolant per minute. In actual operation, the third cooling unit operates on and off. Each cooling unit is operated by a one-half horsepower

MODEL 6-G

# DRILL GRINDER



#### INCREASED PRODUCTION

Free cutting accurate drills permit drilling machines to be operated at their most efficient speeds.

#### . LONGER DRILL LIFE

Less drill material is ground off when resharpening drills.

#### MORE HOLES PER GRIND

Correctly ground—drills remain sharp for a greater number of holes.

#### REDUCED ASSEMBLY COSTS

Eliminates under- and over-size holes.
Saves reaming and boring.

#### • RECLAIMS DAMAGED DRILLS

Sellers grinding method reclaims many burned and broken drills that are ordinarily scrapped.

#### @ ECONOMICAL

This Sellers Grinder has been known to have earned its original cost as many as six times over within a single year.

Among Heavy Machine
Tools built by
Consolidated are....

LATHES BORING MILLS DRILL PRESSES MILLING MACHINES BORING MACHINES COLD SAW MACHINES BORING, DRILLING AND MILLING MACHINES DRILL AND TOOL GRINDERS PLANERS SLOTTERS RAHROAD SHOP TOOLS AUTOMOTIVE TOOLS AND OTHER SPECIAL MACHINES

The Sellers 6-G Drill Grinder provides an improved method of grinding that produces correctly formed drill points and duplicate lips. It automatically determines proper clearance according to drill size and grinds drills to equal length for use with multiple spindle drilling machines. This method materially reduces drill maintenance costs. A wet grinder that is especially adopted to grinding high speed twist drills from 1/4" to 3" diameter.

Send for complete information

**BUILDERS OF HEAVY DUTY MACHINE TOOLS SINCE 1848** 

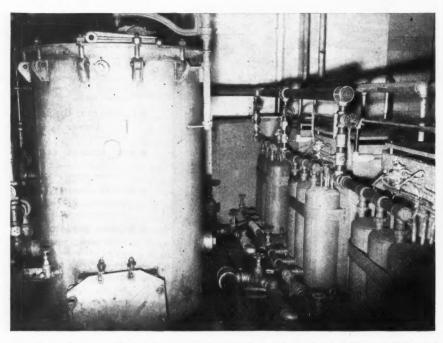
BETTS . BETTS-BRIDGEFORD . COLBURN . HILLES & JONES . MODERN . NEWTON . SELLERS



CONSOLIDATED
MACHINE TOOL CORPORATION

motor. A Hoffman filter is used in connection with the cooling units to clean the coolant.

The results of the addition of these cooling units in this plant have been that the grinding is now held to closer tolerance, the machines operate much plants have found that coolant temperature control can be effectively used in their operations. One plant was plagued with rejects as high as 25 per cent with the total number of satisfactory workpieces produced for an 18-hour shift running to 400. Upon the in-



Rear View of Cooling Setup Showing Coolant Headers and Condensing Units at Right and Filter at Left.

more steadily because there is very much less need for machine adjustments to compensate for expansion of the workpieces or expansion of the machine tool, the grinding wheels wear much longer and require much less frequent dressing and replacing, and the piston rings come out of the operation with a much improved finish. The same coolant, Almag, was used after the installation of the cooling units.

A number of other manufacturing

stallation of cooling units the number of rejects was reduced to zero. In yet another plant in which a thread grinding machine was used the production was increased 25 per cent by the addition of a cooling unit which made it possible to speed up both the grinding wheels and the table of the machine.

In a plant that was producing crankcases, rejects and reworks ran as high as 10 per cent of the total production because of grinding cracks and checks. In this plant a water coolant was used



HIS IS one of those "high" jobs with the arm as high as it will go. But note that all control levers on the head are still within easy reach of the operator.

The value of the "American" Hole Wizard's concentrated control at the bottom of the head is clearly demonstrated by this job.

Note, also, how easy it is for the operator to make the speed changes for the different tools. Not only are the speed change levers within easy reach, but the speed change mechanism is direct reading so the operator can see how to get the speed he wants and get it quickly without fear of mistake.

Operators like "American" Hole Wizard Radials. Ask the man who runs one—see what he says. An operator gets more work from a machine he likes.

Descriptive Bulletin No. 327 tells the whole story. Want one?

THE AMERICAN TOOL WORKS CO.
Cincinnati, Ohio, U. S. A.



because an oil solvent became excessively heated during the machining operation. Reworking rejected crankcases cost from \$180.00 to \$240.00 per day or at the rate of \$30.00 per crankcase reworked. With the addition of a cooling unit to this machine the temperature of the coolant was held at 70 deg. F.—the ideal working temperature—and the number of rejects dropped to zero. In addition, a much better finish was obtained.

It is the recommendation of the Chrysler engineers in handling problems like these that a central cooling unit not be installed in a shop that would serve all machines. Their recommendation has been for the installation of a cooling unit for each machine or, as in the plant under discussion, a group of cooling units for a group of machines. Much more economical operation may be obtained in this way. Very often the engineers suggest two cooling units for a group of three machines, depending of course, on the machines and the operations they perform.

Some of the advantages resulting from the use of cooling units such as have just been described are worthy of mention. In every installation, naturally, not all of these results will be noticeable because conditions are such in each individual installation that all possible problems are not present. But in every installation some benefits will be obtained.

One very noticeable and frequently occurring result will be the prolongation of the life of the machine tool. A continuation of a condition in which excessive heat is generated at the point of cut will, in time, cause it to wear more rapidly than normally would be the case. Temperature control of the coolants prolongs the life of the machine tool and thus greatly reduces replacement costs.

Without temperature control of the coolants, variations in the dimensions

of the work in process will result. Tool wear will be uneven and therefore necessitate adjustments in the machine to compensate for the variations. Such adjustments take time and result in a loss of production which is not the case when a cooling unit is used.

Not only are tolerances difficult to maintain where no temperature control of the coolants is employed, but distortion may occur, causing misalignment of machined surfaces and thus making assembly difficult or impossible. By maintaining a fixed temperature in the coolants, distortion may be controlled within permissible limits.

In cases of continuous operations where workpieces are transferred from one machine to another machine, excessive coolant temperature may cause the temperature of the workpieces to rise to the point at which they are too hot to handle for the following operation. This condition will cause a slowdown in transferring pieces from one operation to another and thus reduce production. A controlled coolant temperature makes it possible for pieces to continue on through all work operations.

In conclusion, if increased production is to be obtained by utilizing speeds and feeds which are higher than those recommended by the manufacturers of the machine tool, the application of refrigerating units to control the temperature of the coolant is one of the best methods available to assure continuous production.

Service Machine Tool Facilities. The Service Machine Co., Dept. L, 158 Miller St., Elizabeth, N. J., has prepared a four-page two-color leaflet illustrating its machine tool facilities and scope of its manufacture by means of photomontages. Services offered by the company include engineering, processing, designing, building of all types of special machinery, contract machining, making of metal-working dies, fixtures, assemblies, and so on. Copy of leaflet free.



## STOP IDLE MACHINE TIME

When weight must be moved, send one man and PORTELVATOR.

Raises, lowers, transports; levels and supports overhanging work... Forms a work bench when and where you need it... Standard model capacities, 1,000 to 5,000 pounds. Special models designed and built on order. Write for bulletin.



e -

e

0

t

3-

d ı-

1-

n

le

ıs

d

e,

ζ-

h

1-

m

ıg

er

n-

it on cig

u-

pnis

to

he

a ng of

ny gnna-

of es,

948

Save RIVET-SETTING 7 ime!... CUT COSTS with

# T-J Pintors

# AUTOMATICALLY FEEDS AND SETS SOLID RIVETS

You'll do a better job of rivet setting faster with T-J Rivitors! Tests show that with the Rivitor you get a solid rivet joint of 10% to 15% greater strength—a completely filled hole no flash-

ompletely filled hole ... no flashing ... a neat, balanced head Geared to speed and accuracy —the T-J Rivitor fits into today's tough production schedules.

The Rivitor cuts costs by using solid rivers instead of more expensive types. Wide range of uses. Write for bulletin. The Tomkins-Johnson Co., Jackson, Michigan.

HORN BRACKETS

- Model RR 1221

Twin Rivitor used for riveting flat steel springs to mounting brackets for automobile horns.

MODEL R RIVITOR — Automatically feeds and sets solid steel rivers \( \frac{1}{16}'' \) to \( \frac{1}{4}'' \) dia incl. and up to \( \frac{3}{4}'' \) incl. long

31 YEARS EXPERIENCE

TOMKINS-JOHNSON

118

# Along with hundreds of other well known

PHOTOS COURTESY ACF-BRILL MOTOR CO.

Along with hundreds of other well known producers, ACF-Brill Motor Company utilizes the production capacity of Racine Automatic Machines to lower the cost of finished parts.

Regardless of the size, kind or shape of your stock, the great cutting capacity and precision work of these machines help you lower the cost of your product. Accurately cut blanks require less subsequent machine work. Fully automatic operation relieves your operators for other jobs.

Full hydraulic operation and control permits extremely simple but heavy, rugged design. This insures a low operating cost—it is the main reason Racine equipment is

noted for its continuous performance, without down-time loss of production.

Get the full story on Racine Machines — single purpose and automatic. Sizes from 6" x 6" to 20" x 20". Ask for catalog 12. Write today. Racine Tool & Machine Co., 1770 State St., Racine, Wis.

## **RACINE Hydraulic Pumps and Valves**

Variable Volume, 12 - 20 - 30 g.p.m. Pressures to 1000 p.s.i. 4-way and other control valves 3/8" to 11/2". Data on request.



STANDARD FOR QUALITY AND PRECISION

# Progressive Die Design, Part X

A description of the dies which are used in forming right and left hand plier handles and automatic telephone switchboard terminals

By C. W. HINMAN
Designing Engineer

THE manufacture of the common hand plier involves a number of interesting operations among which the fabrication of the handles is perhaps the most important. In order to fabricate the handles in the most economical manner possible, the progressive die described herewith was developed.

The size and use of the finished pliers determines the sheet metal thicknesses used for them. Small plier handles are usually made of sheet brass for the reason that brass alloys are easy to blank, form, draw, stretch and emboss, and finish. Gauge thicknesses for small plier handles may be 0.045 inch or less, and for larger ones 0.065 inch, and up.

Steel plier handles are usually copper plated, nickeled or mottled, and then buffed. A single order may run up to 100,000 pairs. In addition to the press work for blanking and forming the right and left handles, many thousands of rivets, pins, and small coiled springs are required. Beside the press work, other interchangeable operations are: drilling, reaming, tapping, assembling, riveting, plating, buff polishing, and the final inspection and packing.

To properly design some of the initial assembling fixtures and partial assembling tools in manufacturing the plier requires more study, experience, and clever draftsmanship than most of us realize, but space forbids discussing these subjects here. It will suffice to say that several years of work were required in the development of some of the special tools and machines.

#### Producing 4,500 Plier Handles Per Hour

Figure 26 shows a four-station progressive die which is used in a 50-ton capacity press that runs 80 strokes per minute, and at each stroke of the press one plier handle is produced. A sample of work is shown in front of the die.

Strip stock is fed from a vertical reel which is located on the right-hand side of the press. The strip passes between automatic feeding rolls which are located at the receiving end of the die; an oiling unit is used to provide lubricant to the strip before the die operations begin.

The four guide bushings in the punch holder shown at the right are

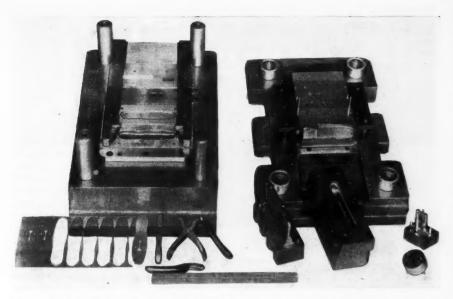


Fig. 26—Illustration of High Speed Progressive Die Designed for the Production of 80 Right or Left Hand Plier Handles per Minute (Courtesy Moore Special Tool Company)

made of a special alloy of phosphor bronze that ensures long wear. The bushing shoulders are of sufficient length so as not to pass above the guide post ends on the extreme upstroke. This feature retains the lubricant around the oil grooves in the bushings and thus maintains a constant supply on the guide posts.

#### **Punch and Die Details**

In operation, the strip enters the die at its right-hand end which, in the illustration, is shown at the upper end of the die shoe at the left. Guide strips are provided, one on each side, along the entire length of the dies, and project over the ends of the five die blocks. The parallel distance between the guide strips allows about 0.010 inch clearance over the width of strip, and permits easy guiding of the strip while it passes over the dies.

Punches are mounted on the face of

the punch holder, and all the cutting punches are surrounded by a spring pressure pad. The pad pushes the scrap strip from the punches when they ascend; in other words, they "strip off" the scrap strip. The two narrow auxiliary pads, arranged on both sides of the punches, contact the strip first in descent, and hold down the edges of the strip before actual operations begin.

#### Order of Die Operations

Two finger stops may be seen at the right in front of the die. The entering end of the strip is halted against the first stop, when the stop is depressed. Next, as the press clutch is "tripped," the punches descend and imprint the patent stamping and the knurling on the handle.

The strip is then advanced again and halted against the second depressed finger stop, and when the punches

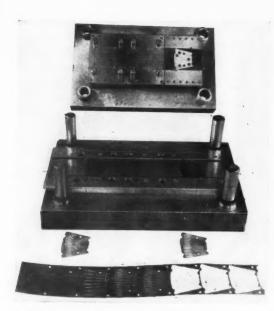
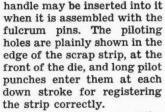


Fig. 27—A Six Station Progressive Die for Piercing, Slotting, and Blanking a High Precision Segmental Blank at the Rate of 120 Parts per Minute

> (Courtesy Moore Special Tool Company)



At the next advance of the work strip, the previously pierced and cut work enters the area of another individual compound die station, which

is the blanking die. At the next down stroke the blank is cut by a punch that enters the die and depresses the blank against a spring shedder in the die. On the up-stroke, the shedder rises under the blank and reinserts it flush within the work strip. The spring pressure pads around the punches hold down the strip while the insertion is being made. The blank can now be advanced along with the strip and into the final station.

In the last station the handle is drawn and formed to its proper shape,

descend, four round holes are pierced. Two of these holes are for the fulcrum rivets in the handle, and the two at the edges of the strip are for "piloting" the work through subsequent stations. In addition to piercing the holes, another opening called a "gutting cut" is cut in the center of the blank at the same station. The gutting cut is performed by an individual compound die, and is subsequently stretched open in the final station, which is drawing and forming. Provision for the stretched opening is made so that the mating

# TO INCREASE PRODUCTION AND TO IMPROVE EFFICIENCY USE BUTTERFLY FILING AND DIE MAKING MACHINES

This is a powerful machine for heavy or small precision work in use all over the world: Airplane Factories, Ammunition Plants, Toolrooms where fast production is desired. 4 Models, No. 16, No. 14 "EL" and Model "D." The larger the Model, the bigger the stroke and therefore more filing is performed. Furnished with or without pedestals. Constructed as per specification of U. S. Naval Aircraft Factories.

## HARVEY MFG. CORP.

161 Grand St., New York,

122

Phone Canal 6-5170



# falcon\_ MAKES NO COMPROMISE WITH QUALITY



**Ground Circular Form Tools** 



**Ground Circular Form Tools** 



Flat and Dovetail Form Tools





Form Relieved Cutters

# FALCON TOOL CO.

ARE LOOKING FOR ADDITIONAL DISTRIBUTORS

WIRE FOR DETAILS AND DELIVERY DATA-WE'LL GIVE YOU QUICK ACTION!

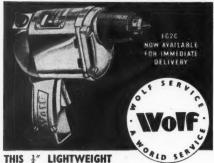
# ANNOUNCING

FIRST TIME IN U.S.A.

# WOLF PORTABLE ELECTRIC TOOLS

NOTED FOR FINE ENGLISH CRAFTSMANSHIP

HALF A CENTURY IN 50 WORLD MARKETS WINNING RECOGNITION FOR FIGH QUALITY



ALL-BALL BEARING PRODUCTION DRILL IS AMAZINGLY VERSATILE AND DURABLE!

This is a popular drill with aircraft manufacturers, body workers, shopfitters and maintenance men. The low weight, short overall length and offset spindle makes this machine particularly suitable for drilling in confined spaces and prevents fatigue in the operator. The ratio of speed to power makes possible a wide variety of operations and uses.





OTHER WOLF PRODUCTION TOOLS COMING SOON

FINE ENGLISH TOOLS—Every one of them performance proved. Prices, deliveries and distributor particulars on request.

## S. WOLF & CO., LTD., LONDON

Warehouse Stocks and Service Depot — New York City. Address inquiries to: U.S. Factory Representative, Fred. L. Stuart, Room IIII, 33 W. 42nd Street, New York 18, N.Y. LA 4-2255.

and the finished work adheres to the punch in ascent, because a spring shedder in the die rises under it. The finished work is stripped from the punch by the two little "sky-hooks" shown projecting over the ends of the die at the last station. The completed handle is blown clear of the die by means of a timed jet of compressed air.

This press tool is designed to make both the right and left hand plier handles. To do this requires two sets of forming punches and dies. One of the sets is shown disassembled under the punch holder, while the other one is assembled in the die. An extra set of piercing and gutting punches and dies are also necessary, and are shown disassembled in the lower right-hand corner of the illustration.

#### A Six Station High Precision Progressive Die

Figure 27 illustrates an intricate high-grade progressive die in which close tool tolerances were necessary in order to meet the requirements of all blueprint dimensions on the work. A sample length of the scrap strip is also shown in the illustration, along with two completed blanks.

Figure 28 is a disassembled view of the punch sections and blanking punch, all of which are precision fitted in their respective punch plates and then secured with screws and dowel pins on the punch holder face. This disassembly also shows two completed blanks, the three stripper plates, 32 coiled springs that activate the stripper plates, and the stripper bolts used.

Notice that four auxiliary guide posts slide in press fitted guide bushings, one at each corner of the stripper plates. This design ensures additional alignment of the punches and dies as they are synchronized in action with the main guide posts and bushings, one at each corner of the die set.

This press tool is a six-station, all ground, sectional die for blanking and

Learning Your Clutch Needs

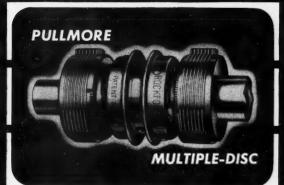
# JUST THE RIGHT



















# ROCKFORD





# CLUTCHES









Your power control and transmission requirements, whatever they may be, will benefit from clutches that are exactly suited to their needs. Thousands of manufacturers — in hundreds of industries — have found that the right ROCKFORD CLUTCHES increase the efficiency of their machines. Our engineers are not restricted to any one type or size of clutch — but are free to specify one that is best suited to the particular operating essentials of your product. Write for our latest bulletin that shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS, with diagrams of unique applications, capacity tables, dimensions and specifications.









ROCKFORD CLUTCH DIVISION

BORG WARNER

300 Catherine Street, Rockford, Illinois

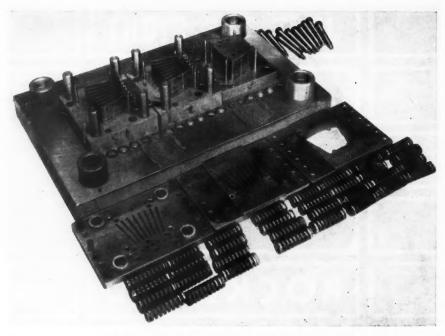


Fig. 28—A View of the Punch Holder and Some of the Many Parts Used in the Die Assembly
Shown in Figure 27
(Courtesy Moore Special Tool Company)

forming blank segments which are used for terminals in automatic telephone switchboards. This segmental workpiece contains 16 long formed slots and 17 small perforations aligned at the centers of the segmental bars. The blanking center distance is 2.859 inches

The Die is used on a 50-ton Henry & Wright Dieing Machine which operates at 120 strokes per minute. Cutting one blank per press stroke provides a gross output of 7,200 workpieces per hour. The work material is 0.035 inch gauge phosphor bronze alloy. Since the small piercing punches and parts of the cutting blades are of less thicknesses than that of the stock, they are therefore expendable and extra interchangeable punches are provided to replace any of the cutting

members. Material of the cutting members is high carbon high chrome tool steel.

# Construction and Operation of the Die\*

Two side notched guide strips, one attached on each side of the work strip and extending throughout the length of the die are provided to guide the work strip over the dies. The strip enters the die at the left end shown in the illustration. At the first station two pilot holes are pierced, one at each edge of the scrap strip. These, and all other pilot holes are bushed in the die, and are jig ground to ensure their correct locations.

<sup>\*</sup>This data was furnished by courtesy of Mr. William D. Angell, Vice President of the Moore Special Tool Company, Bridgeport 7, Conn., whose company designed and built the die.

# YOUR GREATEST VALUE IN BEARING BRONZE

● When you buy Johnson UNIVERSAL Bronze you buy much more than metal. You make a wise investment in bearing performance and economical bearing life. You save considerable money too.

First, you have the widest range of sizes to choose from . . . over 350 solid and cored. Every bar is completely machined, eliminating all extra work and guaranteeing perfection all the way through. Every Johnson UNIVERSAL Bar is entirely usable from end-to-end.

When you cut the bar you are pleasantly surprised to note how easily it handles.





It's NEW...listing and describing the most complete bearing service in the market and it's FREE. When the finished bearing is installed, check up on its performance and life. Note how smooth, how quietly it operates. Note also, the exceptionally long bearing life . . . the elimination of frequent replacement.

Why not try a bar on your next job? Your local Johnson Bronze Distributor carries a complete stock for immediate delivery.

JOHNSON SLEEVE BEARING 590 S. MILL STREET



BRONZE HEADQUARTERS NEW CASTLE, PA. At the second station, while pilots engage in the side holes during the down-stroke, one-half of the long slots are perforated full length. Pockets for the die segments and the slotting punch assembly were jig ground to close tolerances. The die segments and the punches with their bases were form ground with a Panto Crush Wheel Dresser. The segments and punch spacers were ground with a slight taper on their ends, and the whole assembly was locked in position with the end sections tapered on three sides.

After feeding the strip into the third station, the punches descend, the strip is registered by pilots, and the first half of the small formed perforations are pierced. In this station, all the die bushings are split and each was form ground in the Panto Crush Wheel Dresser. Here, it is necessary to maintain the forms central with the outside diameters of the bushings. Punch-

es were form ground and the form itself was kept central to the punch bodies.

To ensure perfect interchangeability all holes in the punch plates and in the die were jig ground and thus aligned within tolerances of plus or minus 0.0001 inch. In order to support and guide the small punches, a hardened and ground plate was inserted in a pocket in the stripper plate, each stripper plate being guided by its own set of four guide pins and bushings, as described previously.

At the fourth station, the punches descend, pilot pins register the strip by its edge holes in the scrap, and the second half of the long slots are perforated. The general construction of this station is practically the same as that of the second station.

In the fifth station two pilots register the strip again, while the second half of the small holes are pierced. This station is practically of the same

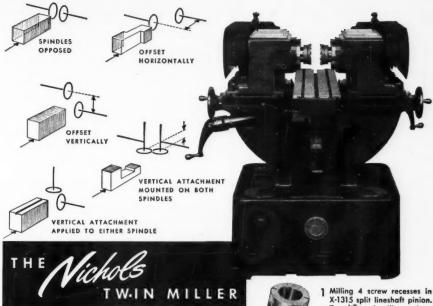
MODERNIZE Your Machine Tools
with MODERN MOTOR DRIVES

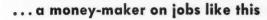


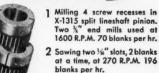
You get more efficiency, more economy and more horsepower to the job with MODERN "V" Belt Drives. MODERN MOTOR DRIVES utilize standard 1750 RPM motors. Drive shafts are equipped with 'Triple Seal' ball bearings... no need to lubricate. In use by leading manufacturers everywhere to improve efficiency of outmoded machine drive methods. Available for practically every type and model machine tool.

Write today for catalog. Immediate delivery.

THE NICHOLS ENGINEERING CO., MODERN MOTOR DRIVES DIV. 2400 W. MADISON ST., Dept. 618 CHICAGO 12, ILL.









For operations such as those diagrammed at the left, the Nichols Twin Miller offers exceptional economy with greatly increased output. Its rugged, precise construction combined with ample power is ideal for machining simultaneously two surfaces which must be held in accurate relation. The preloaded ball bearing spindles may be positioned horizontally, vertically, and crosswise, independently of each other. A solenoid operated air cylinder feeds the table automatically. Fifteen spindle speeds between 55 and 2080 rpm are available. Condensed specifications are listed below. For full details write Nichols-Morris today.

#### Also available are Nichols Two Spindle Hand Millers with identical or opposed spindles and with or without pneuma-



Table, working surface
Table travel — cutting stroke12"
Motors
Maximum height center of spindle above table
Maximum offset of spindles (horizontal)9"
Maximum distance between spindle noses (across table)
Overall Dimensions

CONDENSED SPECIFICATIONS

#### MANUFACTURED BY W. H. NICHOLS COMPANY, WALTHAM, MASS.

NATIONAL DISTRIBUTORS NICHOLS-MORRIS CORP., 50-H CHURCH ST., NEW YORK 7, N. Y.

design as that described for station three.

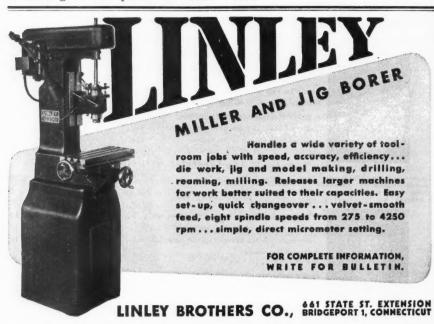
At the sixth and last station the blank contour is cut, after the usual registration of the pilots. In order to economize space, this die station was not of sectional design. The die opening was filed and stoned to size, and the blanking punch was ground all over. The punch had an individual set of pilot pins projecting from its face which were provided in addition to the other two that enter the scrap strip.

The blanking and piercing punch assemblies were mounted on their punch plates in a Moore Die Flipper. This procedure was necessary in order to ensure aligning them to their required parallelism.

#### Assembly of the Die

In the final assembly of this die, all the punch and die members were fitted together without any retouching or stoning of the parts. The first blanks made in the die were carefully checked and found to be well within specified tolerances. The small pierced holes were exactly central within the segmental bars, as specified on the customer's piece part prints. Further, while the following test was unnecessarv, it demonstrates the great accuracy and precision of the above method for progressive die construction. Two blanks were reversed back to back and then cemented together to show their symmetry. This sort of test obviously doubles any possible error in outline, but it was found that all holes, slots and edges of the blanks coincided within 0.0005 inch.

While we do not wish to belittle the skill necessary to construct this die, we would like to emphasize the fact that with proper equipment there seems to be no limit to the accuracy of the tools, or of the precision work that such tools can be made to produce.



130

BEN

DR

ASS

STR

PUS

MET

lvdr

ressi btair Announcing

HYDRAULIC **PRESS** 

for FORMING DRAWING . ASSEMBLING STRAIGHTENING PUSH BROACHING METAL FABRICATION



lydro-Touch Control . . . Both the approach speed of the ram and the applied ressure of the ram are controlled through the movement of one lever and are btained in proportion to the displacement of that lever.

- Totally submerged Hydraulic System
   Wide versatility
- One-piece welded construction
- Write for Catalog 84

HAGARA MACHINE & TOOL WORKS BUFFALO 11, N. Y.

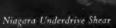
# FOR ADVANCED DESIGN look into....

NIAGAHA



Niagara Deep Throat Press

Niagara Double Crank Press



• The modern design of Niagara Presses, Shears and other machines for plate and sheet metal work is proof of the Niagara talent and experience that is built into them. Men responsible for economical production appreciate these results of Niagara engineering, — high hourly output...convenient operation...accurate work...reliable, uninterrupted performance with minimum down time...low maintenance cost.

Write for Bulletins



America's most complete line of

PRESSES,
SHEARS,
TINNERS
TOOLS
AND
MACHINES
FOR
PLATE AND
SHEET METAL
WORK

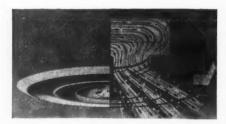
# Air Diffusion as an Aid in Precision Manufacturing Operations

A description of the devices which can be used to provide maximum air circulation in air-conditioned manufacturing plants and departments.

By F. HONERKAMP

Chief Engineer, Anemostat Corporation of America

WHEREVER machined parts must be held to close tolerances—in plants where proper functioning of the finished product demands the highest degree of skill on the part of machinists—air conditioning and air diffusion play a stellar role. Control of temperature, humidity and air purity are ex-



Metal cones of this "aspirating" air-diffuser are designed so that passage of incoming air (black arrows) through them siphons a series of counter currents of room air (white arrows) back into the cones. Simultaneously, air-expansion within the cones greatly reduces the incoming air-velocity. In this way, the supply air is pre-mixed with about a third of its volume of room air within the diffuser before the mixture is slowly and thoroughly spread throughout the room in a draftless pattern—this is called "aspiration."

tremely important in factories that are engaged in the manufacture of instruments, watches, gear-cutting machines, radio and radar parts, optical goods, gages, meters, printing machinery, laboratory testing apparatus and photographic developing equipment.

If equipment parts are to fit together properly, they must be made under controlled conditions—likewise, efficiency of personnel is held at its peak when comfortable, draftless atmospheric surroundings are maintained

Perhaps the best illustration of a machining operation that requires careful regulation of all factors including temperature and humidity is that found in the production of large marine gears. Some of the mammoth gears require 17 days for hobbing, must be suitable for replacement service in any part of the world, and may be shipped to points for assembly where the climate is entirely different.

The value of an instrument depends upon the accuracy with which it reCIMC



# Easy to figure how CIMCOOL lowers metal cutting costs . . .

Cost figures show it in plant after plant. Cimcool—the revolutionary cutting fluid—this chemical emulsion—saves money three important ways.

- 1. Longer Tool Life (and therefore less down time) because of Cimcool's chemical lubricity.
- 2. Faster Speeds are possible because Cimcool cools faster, through a unique physical change in the cutting fluid itself. Tools and chips actually stay cool to the touch.
- 3. Cimcool Costs Less than old-fashioned cutting fluids because it lasts longer in the machine and reduces the cost of cleaning and changing machines. It isn't subject to rancidity. Its low surface tension and low adhesion to work and chips virtually eliminates carry off.

CIMCOOL DIVISION OF THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U. S. A.

CIMCOOL® 35%

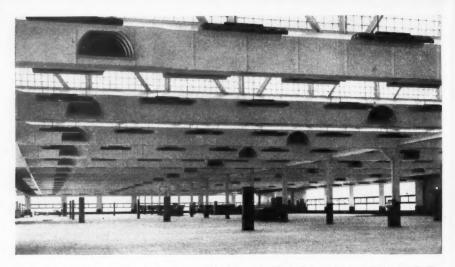


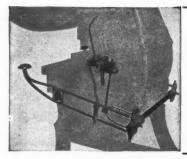
Illustration showing inside of International Business Machines Corp. plant at Endicott, N. Y., prior to installation of machinery. Here wall-type air diffusers are shown on air duct hung at a considerable distance below the root.

cords or indicates. Many parts in instruments of the indicating or recording types must be nearly frictionless. Conditions normally maintained in departments where metal parts for instruments are processed usually involve a temperature level between 75 and 80 deg. F. with plus or minus 1 deg. tolerance. Relative humidity is from 45 to 50 per cent.

Today, gages are universally employed in all types of precision manufacturing operations, and, because such measuring devices are sensitive to changes in temperature, humidity and cleanliness, they should be kept in

storage rooms where the atmosphere is controlled and the gages should be used under the same kind of conditions for checking work. Experienced gage men claim that a difference of 1 deg. F. may cause a noticeable change in measurement standards. Thus, temperature is usually held to plus or minus 1 deg. F. and humidity to plus or minus 5 per cent.

The foregoing data emphasizes the need for accurate control of atmospheric conditions in precision machinchining operations. Therefore, many plants have installed air conditioning



# SAFETY EQUIPMENT FOR POWER AND FOOT PRESSES

Combination Gate and Barrier Guards
Two-Hand Safety Starting Devices
Sweep Guards . . . Single-Stroke Attachments
Stock Reels . . . Fly Wheel Guards, etc.

Write for Details

JOHN HUMM SAFETY EQUIPMENT CO. 251 SHEFFIELD AVE. BROOKLYN, N. Y.

136

to

be

er

an

P

m

fo

# **PROSSER** ... Pay for themselves—fast...

Shop experience proves it: Prosser Grinders reduce waste and breakage of costly cemented carbide tools-and help them deliver more cuts between grinds. Also equally effective for stellite and highspeed steel.

QUICK SETTING. The famous Prosser index device speeds setting of table to desired angle. Table need never be raised or lowered - and once set, it stays put.

MORE WORK PER WHEEL. Easy compensation for wheel wear. Wheel face can be kept close to edge of table . . . wheels can be used up practically 100%. Fewer wheel changes, more time and money saved.

Prosser Carbide Grinders are made in bench and floor models, for rough grinding and fine finishing, wet or dry. Chip-breaker and drill-grinding attachments.

Write for literature on moneysaving Prosser Grinders - designed by the same Prosser engineers who introduced cemented carbide to American industry.

**Dealerships Available** 



Model AA for dry grinding

for grinding dry or wet.

Established

THOMAS PROSSER & SON

1845

120 Wall Street, New York 5, N. Y.



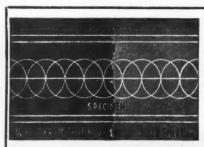
Vega Aircraft Corporation, Burbank, California, showing air diffusers mounted on ducts attached to roof trusses.

systems in order to attain the desired objectives. However, many of these installations are unsatisfactory because of improper air diffusion.

If conditioned air is introduced into a room through grilles, registers, or other conventional fixtures, it sweeps to the floor and forces room air to the ceiling. Until the velocity of the incoming air subsides, it cannot mix with the room air. This condition produces drafts, unequalized temperatures. poor humidity control, air

stratification, stale air pockets, and other objectionable conditions.

Such difficulties can be avoided only by reducing incoming air velocity at duct openings. Then, the incoming air and the room air can be mixed well above the occupancy level before the mixture is distributed in a controlled, draftless pattern. This means far more than merely supplying the proper volume of properly conditioned air, for if the air circulates improperly—even after it leaves the ducts—no uniform—



# DYKEM STEEL BLUE

Stops Losses in Making Dies and Templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

#### THE DYKEM COMPANY

2301F NORTH 11th ST.

ST. LOUIS, MO.

uoceep

t

a v a ti

ir m

a

80

th

ai

lo

di

tr tr

th pl

CC

Ve

SC

th

in

(In Canada: 2466 Dundas St., West, Toronto, Ont.)

ity of temperature and humidity levels can be maintained.

Difficulties of this kind may seem unwarranted when thermostats and other standard instruments of an air conditioning system indicate that everything is operating properly. Nevertheless, if there is any reason to suspect trouble, a check should be made.

Often an ordinary thermometer and psychrometer for humidity measurements will show that unsatisfactory conditions exist. By taking readings at various points about the room, from the floor to the ceiling, the engineer will often find wide variations in temperature.

If both temperature and humidity are unequalized to any extent, a wide variance will undoubtedly be found in air velocities throughout the conditioned enclosure. The engineer can convince himself of this by simply noting how the air movement affects a match flame, tobacco smoke, or cotton fluff.

An accurate test may then be made with a thermoanemometer (thermometer anemometer). A Kata-thermometer may be used for the same purpose, although this instrument is cumbersome and requires more time to operate. Perhaps the best instrument for this type of test is the Anemotherm air meter, whose small probe at the end of a long cable measures air velocity, temperature and static pressure.

If the previously mentioned tests indicate that air is being improperly distributed throughout the enclosure, the fault can often be found right at the air-duct openings. In one large plant in the mid-west, for example, blasts of cold air from two grille-type outlets were so severe that employees could not endure the drafts. When conventional outlets were replaced by scientifically designed air-diffusers. the unsatisfactory conditions were immediately eliminated.











Hammons

# CARBIDE TOOL GRINDERS • POLISHING LATHES • AUTOMATIC and CYLINDRICAL FINISHING •



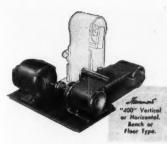
Hammond of Kalamazoo, builders of good machinery since '82, has kept in the forefront of finishing equipment developments for years. We will continue to maintain this leadership in the future by constant improvements in Hammond Machinery, but every new development will have been tested, chiery, but every new development will have been tested of salways, in the crucible of practical use. You are entitled to as always, in the crucible of practical use. You are entitled to assurance and you can rely upon it as your yardstick in your standardization or expansion program.

"OD" Cylindrical Finishing with wheels or obrasive belts
- handles tubes, rods, bars and other Cylindrical shapes.





Dece



VH-2 Flexible Bell Grinder Bench or Floor Type.



Model 50-D Grinder-Polisher Combination Bench or Floor Type for wheels or obrasive belts

# of KALAMAZOO

# ABRASIVE BELT GRINDERS-POLISHERS and BACKSTANDS

Prominent in the complete line of Hammond Grinding and Polishing Equipment is our Abrasive Belt Line of Grinders, Polishers, Grinder-Polisher Combinations, Flexible-belt and Backstand Units. This relatively new development—the use of abrasive belt machines—that had for its testing-ground the high production demands placed upon it throughout the war years. For faster, better grinding, upon it throughout the war years. For faster, better grinding, upon it demands and deburring round, flat and irregular shaped parts in metal, plastics, wood, ceramics and other materials.



No. 3
BACKSTAND
ond Variable
Speed
Polisher Unit



No. 4
BACKSTAND
For use with
abrasive belts



Hammond Machinery Builders

1615 DOUGLAS AVENUE . KALAMAZOO 54, MICHIGAN



Kollsman Instrument Company, Division of Square D Company, Elmhurst, N. Y., showing assembly line with air diffusers on ceiling.

In another plant, the air conditioning system failed to maintain the temperature and humidity required for the manufacturing process. A study showed that the trouble was entirely due to the air being improperly distributed after leaving the ducts. When efficient air diffusers were used to replace plaque type outlets, temperature and humidity were closely maintained throughout the room. And, even after

air changes were substantially increased for more efficient operating conditions, all drafts were eliminated.

When air enters a room through conventional duct outlets—grilles, registers or perforated panels—it usually sweeps to the floor and forces the room air to the ceiling. Until the velocity of the incoming air subsides it cannot mix with the warmer room air. This results in a room filled with drafts and



# MASTERCRAFT ROTARY TABLES

The Mastercraft Drill Press and Milling Table conforms to the exacting standards of best machine tool construction. A great time saver. Cuts keyways, special shapes, splines and innumerable other forms, and drills on a dead straight line or on a radius.

Write for circulars describing this model and 600, 700 and 800 Series for heavier work.

F & M SALES, INC. 1054 CAHUENGA BLVD.

HOLLYWOOD 38

CALIFORNIA



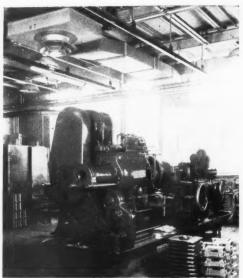


125 PINDLAT ROAD

REPRESENTATION IN MOST PRINCIPAL CITIES

LIMA GEARSHIFT DRIVES





General Electric Company, Pittsfield, Massachusetts, showing a section of machine shop with air diffuser on ceiling duct.

velocity within the device. Simultaneously, air from the room—equal to about 35 per cent of the incoming air—is siphoned into the diffuser where it is mixed with the incoming air.

The pre-mixed air then leaves the diffuser at a low velocity and spreads over a pre-determined area well above the occupancy zone, and then finally reaches the working area as a slow moving low pressure blanket.

Because the primary air mix-

ing action takes place within the diffuser, and because
all major air turbulence is limited to its immediate vicinity, no
drafts are perceptible to occupants of
the room. It might be said that the air
mixture settles into the room instead
of sweeping in, as it does when grilles
and similar type fixtures are used at
duct openings. Thus, obstacles such as
columns, machines and furnishings do

not deflect air flow. And stagnant air

pockets—whether undercooled or overcooled—are eliminated as a result

of the thorough distribution of air in

every part of the room. The overall re-

turbulent air; temperature differentials are great throughout the room; humidity is unequalized, and stagnant air pockets are prevalent.

In the plants previously mentioned, such unsatisfactory conditions were rectified by installing "aspirating" air diffusers. These devices, as shown in the accompanying illustration, are composed of a series of metal cones assembled in definite relation to each other. Air entering a room passes through the cones and, because of their unique design, is instantly reduced in

Pictured: a 24-Spindle Heavy-Duty Drill Head.

DESIGNERS AND MANUFACTURERS OF MULTIPLE DRILL-ING EQUIPMENT.

We invite Your Inquiry.



MICHIGAN DRILL HEAD CO. 971 E. 8-Mile Road, Hazel Park, Mich.

Sturdy, compact, for really heavy lifting jobs. Saves time, saves men, saves materials. Three models, 500 lbs. to 2000 lbs.



Type DX— 2,000 lbs.



Type D-500 lbs.



All steel, welded, framework. Easily operated hoist unit with automatic brake, holds load at any height.

500 pound capacit	
Type D, hand operated	\$157.50
Type DE, electric 1/3 HP unit	\$315.00
1000 pound capaci	
Type DX, hand operated	\$320.00
2000 pound capaci	
Type DX, hand operated	\$370.00

Floor lock to hold machine steady: \$10.00 extra for 500 pound sizes; \$15.00 extra for type DX models.



### ECONOMY ENGINEERING COMPANY

4507 W. Lake Street, Chicago 24, Illinois



sult is even, draftless air distribution that causes both temperature and humidity to be closely equalized through-

Simonds Saw & Steel Company, Fitchburg, Massachusetts, showing section of shipping room. Roof trusses support ducis and air diffusers.

out the entire room.

However, before air can be distributed in this controlled pattern, various factors must be considered. Here are some of the points to be considered: the use

of the room, minimum and maximum number of occupants, the area of the room, height of the ceiling,

# HIGH SPEED PRODUCTION CONTINUOUS OIL GROOVING

WICACO CONTINUOUS OIL GROOVER cuts grooves of all descriptions, internal or external, continuous or intermittent.

Send us samples for grooving. We will return them cut to specifications, with a record of time and cost estimate. No obligation.

Ask For Descriptive Booklet And See How You Can Improve Your Production.



SINCE 1868

MACHINE CORPORATION

WAYNE JUNCTION, PHILA. 44, PA. Manufacturers of **Precision Machinery and Machine Parts** 





rg, wipof

re bnrs dre n-

se iea g,

Anne per enter a p

8



### - Yet Low Priced!



84 different models for doing light and medium size work. Heads and other parts available for building up inexpensive special purpose machines.

Helmet-Heads have larger and longer quills for the spindle—to take heavier thrust loads and to do more accurate deep-hole drilling and tapping. Heavy box-type head has 33% to 50% more bearing for the quill, so 4" or more of the quill is always supported. Hence, years more wear at the point where most light drill presses fail, also less vibration and fewer broken tools.

A costlier 6-tooth spline drive—involute shaped spline teeth, and all long-wearing steel instead of die-cast. Heavier-walled column, 38" thick for greater rigidity and closer tolerance at the chuck on heaviest thrust. Balanced for higher spindle speeds.

Tapping Heads, and full line of woodworking accessories for routing, mortising, etc., are available as extras.

### SPECIFICATIONS:

Capacity: 15"; Maximum %" Drill, 4" Tap. Spindle Feed: 4".

Speeds: Hi-speed Models—500, 925, 1750, 3250, 5500.

Slo-speed Models—425, 775, 1330, 2200, 3340.

Bearings: 4 New Departure Ball. Grease-sealed.

Spindle: %" dia. 6-tooth involute type spline.
Tables: Standard—size 10" x 11"; tilts 45°.
Production—work surface 11" x 16".

Clearance Table to Chuck: Bench—174"; floor—394".

Height overall: Bench—42"; floor—71".

WRITE FOR FREE LITERATURE

### **BOICE - CRANE COMPANY**

937 Central Avenue

•

DRILL PRESSES • JIG SAWS • BELT SANDERS
SAW JOINTERS • THICKNESS PLANERS •
SPINDLE SANDERS • SPINDLE SHAPERS

Toledo 6, Ohio

design of the ceiling, locations of duct openings, duct sizes, duct velocities, permissible air velocities within the room, number of air changes per hour, permissible sound levels, locations of columns and other obstructions, the location, type and heat-load of lighting fixtures, location of exhaust outlets, unusual concentrations of internal heat, solar radiation, and other items.

It is readily seen that it is a job for an engineer to select the type of diffuser to be used for a particular job. Such specialists are available from air conditioning firms and from manufacturers of air diffusers. Because of the various factors involved, one single design of "aspirating" air diffuser could not be expected to solve all air conditioning problems. Therefore, different designs are used for different conditions. For example, 180 "aspirating" diffusers are used in a large factory building in New York. Because

conditions differ throughout the building, 72 of the devices are wall-type and 108 are ceiling type. In some parts of the building duct velocities exceed 1500 feet per minute, yet velocities in occupancy zones do not exceed 40 f.p.m.—an air motion of less than one-half mile per hour.

Since these "aspirating" air diffusers circulate air of the highest duct velocities in a draftless pattern, they make it possible to install smaller ducts to handle larger volumes of air than is customary. Duct layouts also may be simplified because the "aspirating" diffusers—when properly selected and located—thoroughly distribute the air in spite of machines, columns, and other obstacles. Small ducts and simplified layouts enable the contractor to save valuable space and reduce installation costs in spite of the cost of these air-diffusers.

Air distribution does not end at a





Above: Hand-powered Type A-30...up to 180° bends ...all sizes from ½" to 2". Only 7 parts. World's fastest, simplest machine. Note assortment of bending dies ... this process makes shorter tangents than any other. Occupies only 18" x 18" floor spacel

### Other Sizes Available

Factory and Main Office: 14 Furnace St., Poultney, Vermont



Above: Motor-powered Type E . . . bends fixed radii of 6 to 1 up to 90°. Type E bends 2½", 3", 3½" and 4" pipe. 3 horse-power motor. Floor space occupied—7' 6" x 7' 6". Other power machines up to 8" capacity.

" AMPTICUM"
PIPE BENDING MACHINE
Company INC.



## **OILITE** FINISHED MACHINE PARTS

With the shortage of castings, stampings and forgings, manufacturers look to Amplex for OILITE finished machine parts, from metal powder, replacing those materials. Very frequently Amplex furnishes OILITE finished machine parts, through powder metallurgy, at a saving. Other advantages of OILITE parts are short tool up time, quick delivery, improved appearance, and the incorporation of details of design not machinable by production machine tools.

Send your blueprints to Field Engineer or Home Office. Address Dept. H.

# AMPLEX MANUFACTURING CO. MICHIGAN

Division of Chrysler Corporation

FIELD ENGINEERS AND OILITE BEARING DEPOTS IN PRINCIPAL CITIES

December, 1948

MODERN MACHINE SHOP

149



U. S. Army Ordnance Plant at Gadsen, Alabama, showing group of machines in spacious building with extra large air diffusers providing controlled temperature and humidity conditions.

duct opening. Here, in fact, is where scientific air distribution begins—and air distribution can make or break an air conditioning installation—even though the rest of the system is the finest and the most expensive. Where air conditioning systems are being considered for a new plant where quality machine work is a must—or where

an existing installation in such a factory is not providing satisfactory results—have your engineer check the air outlets. It will pay big dividends.

Mention MODERN MACHINE SHOP when writing to advertisers. Your cooperation will be appreciated both by the advertiser and the publisher of this magazine.

## LUERS

# PATENTED CUTTING OFF TOOL HOLDERS PATENTED CUTTING OFF BLADES

ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.

Manufactured by

J. MILTON LUERS. 12 Pine Street, Mt. Clemens, Mich.

Produced under License Issued by John Milton Luers Patents Inc.

150

plet 1/8" hund and dies Schelp Stool

mad

Decem

\$1400 INVESTED IN SUNNENT Tool Room Honing Equipment Pays for Itself in a Few Months

By Speeding Up the Making of Tools, Dies, Jigs, Fixtures

\$1400 buys a Sunnen Precision Honing Machine — completely equipped with honing tools for the full range from  $\frac{1}{8}$ " to  $2\frac{5}{8}$ " diameter. These machines are now used in hundreds of tool rooms to fit dowel pins, ejector pins, die and jig bushings — and to finish ring gauges, extrusion dies and many other jobs.

Sunnen Honing is up to 10 times faster than lapping — helps get out those rush jobs on time.

Sunnen Honing Machines produce outstanding results in tool and die shops — tool makers agree that these versatile machines are a necessity for the well-equipped tool room.

- Smooth finish increases life of parts
- Extreme accuracy tolerances held to twenty-millionths of an inch
- Wide range of sizes any diameter from .120" to 2.625"
- Instant changeover to any size hole
- Sunnen Honing corrects hardening distortion, bellmouth, taper, reamer chatter, and out-of-round holes

It will pay dividends to investigate the money-saving possibilities of Sunnen Honing for your own tool and die shop.



Ring Gauge





Drill Jig Bushings



Extrusion Die

388

WRITE FOR BOOKLET MAN-5
—or call in a Sunnen engineer.

SUNNEN PRODUCTS CO.

7978 Manchester Ave. • St. Louis 17, Mo.

Canadian Factory: Chatham, Ontario

SUNNEN HONING

"Low-cost production of precision holes"

WINTER BROTHERS TAPS ARE DEPENDABLE

# PRODUCT ENGINEERING and DEVELOPMENT

Winter Commercial Ground
Thread Taps are typical of
Winter depastability. They
are farm ground after
herdening by an antituries
Winter process, and will
work freely usen on tough
materials.

The design of Winter taps is based on

two diaments: leberatory testing and field testing. In the field, Winter tops are tested under actual production conditions. Reports of these tests are forwarded to the Winter (abercateries. Here the Information gainest in the Gold is used to guide experiments in the development of before cuting tools. That is, why when you specify Winter Taps you get taps which incorporate the letest of vencements in metal cutting.

Always at Your Service

YOUR LOCAL DISTRIBUTOR carries a complete stock of WINTER Taps on his theiros—us close to your capping problems as the telephone on your desk.



**ኢ**ኢኢ

7()inter Brothers COMPANY

ROCHESTER, MICH, and WRENTHAM, MASS. . Obstributors in Principal Cities A Division of the Reliand Twist Drill and Tool Company - Connel States San Francisco, Chicago, Defrois



"Why is it that National tools last so much longer?" One reason, we believe, is that in our new plant at Rochester, Michigan, we have the most complete and upto-date manufacturing facilities to be found anywhere. These facilities contribute to the performance built into National High Speed and Carbon Steel Twist Drills and Reamers, High Speed Steel Milling Cutters, End Mills, Hobs, Counterbores, and Special Tools.



Call Your Distributor

LEADING DISTRIBUTORS EVERYWHERE offer complete stocks of NATIONAL Cut ting Tools. Call them for cutting tools or any other staple industrial product.







With the motor mounted on an easy-rolling pedestal or overhead trolley, a Mall Fexible Shaft Grinder—equipped with lightwight working tools—enables you to finish larger areas faster, easier, cheaper with less fatigue. Because the motor is not carried, more copper and iron is used to protect against burnouts on overloads, more power is developed, and the motor is sealed against dust, grit, steel particles, dirt, grease and vapor. The lightweight working tools are more comfortable to hold than heavy self-contained tools, and the attachments for grinding, sanding, buffing and polishing can be interchanged by simply pressing a button. 3 H.P. Geared Head, 3/4, 1, 11/2 H.P. Direct Drive and 3/4 H.P. Countershaft models are available.

Ask Your Supplier to demonstrate a Mall Flexible Shaft Grinder in your shop TODAY and write for FREE booklet "Mall Grinders."

### MALL TOOL COMPANY

7814 South Chicago Avenue

Chicago 19, Illinois

Preferred by Master Craftsmen

### the PRODUCTS of TOMORROW are in the RESEARCH LABORATORIES TODAY



Send for Descriptive Bulletins

### **HEVI DUTY** ELECTRIC COMPANY

HEAT TREATING FURNACES HELETTY ELECTRIC EXCLUSIVELY DRY TYPE TRANSFORMERS - CONSTANT CURRENT REGULATORS

ole

er re

elor.

ed er-

ve Y

ls

48

# TODED Overhauls hug

THE machine shop of the Todd Brooklyn shipyard recently completed the overhauling of a huge 35,000 K.W. turbine casing and exhaust chamber for the Kent Avenue power plant, Brooklyn, New York. Work on the casing, which weighed over 15 tons, was done at the Todd Plant, while Todd workers went to the power

plant to put the stationary exhaust chamber in condition to receive the overhauled casing and rebladed rotor. The work was done in cooperation with the General Electric Co., manufacturers of the turbine.

The job, as shown in the accompanying illustrations, involved reboring and facing off all diaphragm landings in

the inner high pressure and low pressure casings, and installing stainless steel angle bars in the casing, as well as stainless steel strips on the diaphragm facings. The work was necessary in order to make the landings and facings





(Left Above) View showing the high-pressure casing of a 35,000 K.W. General Electric Turbine from the Kent Avenue power house, on the boring mill at Todd Brooklyn shipyard machine shops. Note the heavy erosion on the diaphragm facings, which were rebored and faced with stainless steel.

(Left) One of the rotor diaphragms which were rebladed at the Todd Brooklyn Division as part of the over-haul of one of its two 35,000 K.W. General Electric turbines. rhine

(Right) Todd workers operate a portable boring bar to rebore the exhaust chamber and insert stainless steel strips in way of the inner casing flanging and supports.

(Center) View from inside the huge exhaust chamber, showing one boring head revolving around the opening at about one r.p.m.

7d n

h

W

S,

g

ie

LS

1

1-

S.

S er

S

h-

α

al

m v-Td d te on

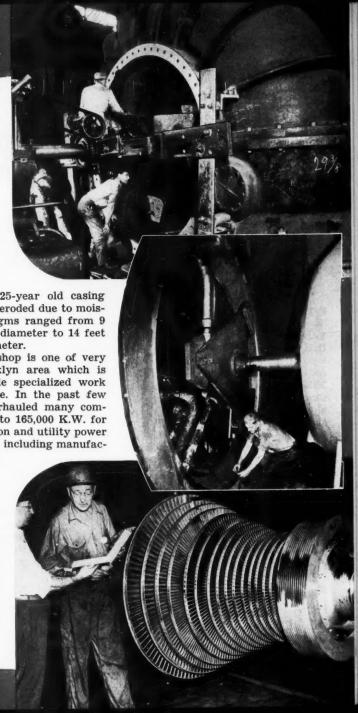
ch

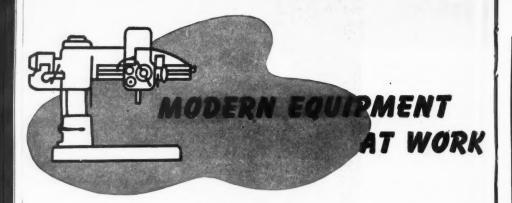
ne ri-

he its nsteam-tight. The 25-year old casing had become badly eroded due to moisture. The diaphragms ranged from 9 feet 61/2 inches in diameter to 14 feet 41/4 inches in diameter.

Todd's turbine shop is one of very few in the Brooklyn area which is equipped to handle specialized work of such magnitude. In the past few years, it has overhauled many complete turbines up to 165,000 K.W. for other transportation and utility power houses in the area, including manufacturing rotor blades.

Close-up of (Right) the Allis - Chalmers 8,500 s.h.p. cross-compound low - pressure turbine regrooved and rebladed at the Todd Brooklyn Machine Shop. 2800 blades were made by Todd of corrosion-resistant steel for four dia-phragms in the low pressure section.





### Special Application Illustrates Versatility of Beckett Hi-Cyclic Air Valve

TYPICAL of the unusual jobs to which the Beckett Hi-Cyclic Air Valve may be effectively adapted is that shown in the accompanying illustration Fig. 1. This special forming fixture was designed and built by the Monarch Tool and Manufacturing Co., Cincinnati, Ohio, for forming flat aluminum strips into elliptical shaped shells which are subsequently fastened to eaves drains and, when mounted on the outside of a house, to downspouts. Altogether, five air cylinders

actuated by three Beckett Air Valves (one basic and two single solenoid) are required to perform the various operations necessary to form the aluminum shell.

After an aluminum strip has been placed in position on the lower forming die A, the operator presses the starting button B. All operations from this point are completely automatic. The piston of air cylinder C rises, forcing die block on which the work strip is located against elliptical form D. Forming head E actuated by air cylinder F moves to the left forcing the now one-third formed workpiece a round D. Immediately following, forming head G, actuated by air cylinforming head G, actuated by air cylin-

der H, moves to the right to close the two ends of the work strip. Since the two ends of the work strip were formed with a short right angle bend in a previous forming operash

ga

01

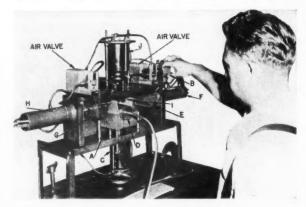


Fig. 1 — Illustration showing special application of Beck-ett Hi-Cylic Air Valves designed to increase production of aluminum elliptical shaped shells.



Weighs only a little more than a pair of snips. Cuts your costs on sheet metal work. Zips through 18 gauge steel at speeds up to 15 feet a minute . . . straight ahead, curves, angles, notches . . . inside or out . . . right on the line. "Feeds in" the work so operator only has to guide it. Blades easily removed

for sharpening. Aluminum alloy housing, ground gears, ball and roller bearings, slide operated switch, duplex handle. A real production tool for fast cutting of sheet metal. Sold through your industrial distributor. Write for literature. Stanley Electric Tools, 520 Myrtle St., New Britain, Conn.



CRADLE for converting the No. 218 to a rigid, bench power shear. CIRCULAR CUTTING AT-TACHMENT for cutting perfect circles up to 20". STANLEY

Reg. U.S. Pat. Off.

HARDWARE • HAND TOOLS

ELECTRIC TOOLS • STEEL STRAPPING

LD.'s OF UNIVERSAL DRILL BUSHINGS wear longersave you money

UNIVERSAL ENGINEERING CO. FRANKENMUTH 9, MICH.

tion, these ends are now overlapped.

As flat bar I actuated by air cylinder J moves downward against the work, the two ends of the workpiece are locked together and securely crimped. At the completion of the forming operations, the forming dies automatically return to their original

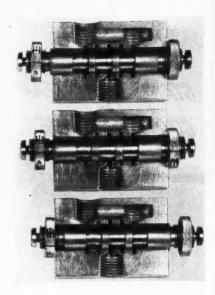


Fig. 2—Cutaway view of Beckett Hi-Cyclic Air Valves showing piston in three positions. (Above) Piston at left. (Center) Piston in center. (Below) Piston at right.

positions leaving their formed workpieces in position on elliptical form A.

An air-actuated piston located at the rear of the fixture and in line with the workpieces advances in the direction of the workpiece and shoves it off the elliptical form onto a pipe located at the front end of the form along which it slides downward into a tote box on the floor.

The ingenious workings of this fixture are made possible through the application of Beckett Hi-Cyclic Air Valves. These valves, cut-away views of which are shown in Fig. 2, were de-



Imagine drawing 19 gauge steel to a depth of 15-5/16" with a single press stroke! From a blank size of 441/4" dia. to a 23" dia. tub is a reduction of 48%. Spectacular? You bet it is . . . and what's more, this H-P-M press owner\* has less than 1% scrap loss, even with today's irregular stock! The tub bottom is embossed in the same operation. Production of 100 tubs per hour is a record, too!

Here's why H-P-M presses really pay off . . . constant drawing speed; smooth, fast action without impact; independent pressure adjustments of punch, blankholder and die cushion; positive blankholder pressure for entire length of draw; shockless reversal. With H-P-Ms, you have positive overload protection . . . there's no chance for breakage . . . press reverses at a predetermined pressure. H-P-Ms also permit you to change dies quicker . . . a real factor with today's short runs due to low steel supply.

Call in a nearby H-P-M Engineer to tell you more about these money saving H-P-M hydraulics. Write today.

\* Name and address upon request.

d. n-

ne ce

ly he es al

Air

ns.

k-A.

at

th

C-

off

ed

ng

te

X-

pir

ws le-

48

THE HYDRAULIC PRESS MANUFACTURING CO. 1048 MARION ROAD • MOUNT GILEAD, OHIO, U. S. A. Branch Offices in New York, Cincinnati, Cleveland, Columbus, Detroit, Pittsburgh, and Chicago. Representatives in other principal cities. Export Dept.: 500 Fifth Ave., New York. Cable—"Hydraulic"



Write for Bulletin 4706. It tells more about the time and money saving features of H-P-M metal working bydraulic presses.



All-Hydraulis
Self-Contained METAL WORKING PRESSES

REVOLUTIONIZING PRODUCTION WITH HYDRAULICS SINCE 1877

signed primarily to fill the need for an accurate, fast, and smooth control for air power in automatic production work-feeding operations. The valves are made of bronze and stainless steel -the valve body and directional control lock nuts being of bronze and the valve piston of stainless steel. Since both of these metals are corrosion resistant, clogging due to corrosion is said to be reduced to a minimum. The simplified construction of the valve is emphasized by the fact that only one moving part, the piston, is required. Since the piston is precision machined, no seals are required. The valves provide self-contained speed control in two directions. Another feature of the valve is the instantaneous action which can be obtained. Large port chambers provide unrestricted passage of air and insure that foreign material from an air line cannot cause malfunction of the valve. The dual pressure ports which are provided in the basic construction of the valve enable an equalized force to be exerted on the piston, which, with a slight bypass of air, floats the piston, making the operation effortless.

### Soldering and Degreasing in One Operation with Infrared

THE operations of soldering and degreasing of small metal parts are now being performed as a combined operation at the Fostoria Pressed Steel Corp., Fostoria, Ohio. A handling system and an infrared oven were designed for use in the plant by the plant engineers to process the parts in one pass through the oven. The equipment was designed after it became increasingly difficult to solder and degrease, with the former equipment, such parts as sheet metal tubes and stud and ball units, all parts of



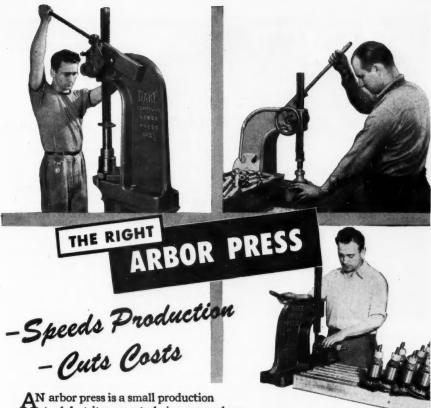
A precision tool for testing and checking parts between centers. Both heads adjustable, locked in place by lever-operated clamps. Work is held between one fixed center while spring loaded retractable center clamps work in position. Dial indicator with adjustable holder available as extra equipment.

FREE ADDITIONAL DATA covering complete specifications and additional features is contained in this bulletin. Write for your copy today. Ask for data sheet No. 579-

# SUNDSTRAND

MACHINE TOOL COMPANY

2539 Eleventh St. • Rockford, Illinois, U.S.A.

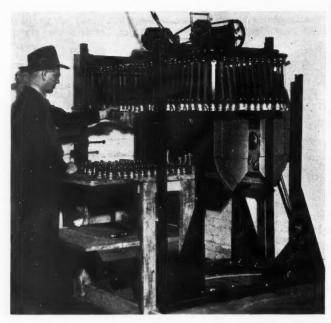


tool, but its correct choice can make a

big difference in production costs. Dake arbor presses are available in the most complete range of sizes offered by any manufacturer, and can be provided with hand lever or wheel operation. Pressures available range from 1 ton on up, and every press is designed for minimum maintenance and long life. If you have any production problem where controlled pressure is needed, mail the coupon below for the Dake catalog, or send in details of your problem for our recommendation. There is no obligation.



Dake Engine Company 612 Seventh St., Grand Haven, Mich.
Please mail me a copy of the latest Dake Arbor Press Catalog.
Name
Company
Address
City



Soldering and degreasing with infrared at Fostoria Pressed Steel Corp.

ball and socket joints used in the lighting units which are manufactured at the plant.

Small grooves are machined in the studs, solder is placed in the grooves, and the metal tubes to which the studs are soldered are fitted tightly over the studs. The parts are then conveyed through the newly designed infrared oven where they are heated to a temperature of 520 deg. F., a temperature sufficient for both soldering and de-

greasing. Reflectors, located behind the infrared bulbs in the oven. are goldplated to assure maximum reflection of the infrared rays. The equipment cycle is such that each part is processed in approximately two minutes, and 500 parts per hour are handled. The cycle is variable in that a

special drive which is mounted on top of the frame controls the conveyor speed, and a hand adjustment is provided to vary the speed as the sizes of the parts vary. The setup may be seen in the illustration. An automatic unloading device, not shown in the illustration, may be attached to the equipment to trip the part holders as they leave the oven and deposit the parts in a convenient container.

The installation has proved to be

# NO BUSHINGS, GUIDES or PILOTS NEEDED!

THE READING BROACH KEYSEATER

The Reading Bench Machine requires no bushings, guides or pilots. No other machine like it. Very fast—capacity from 1/8 to 3/8 cutter.

Low first cost—prompt delivery.

READING MACHINE COMPANY, Reading (Cincinnati), Ohio



denfraria orp.

ectbered ven, l to um

the The cle ach sed tely and

per led. aritop

yor ros of een un-

ilthe as

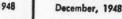
the













165

both labor-saving and time-saving. It was formerly necessary to employ three people to assemble, prepare, and handle parts to be soldered. Now, by means of the infrared oven, the operation of degreasing has been added, one man is able to perform all of the operations on the equipment, and production has been increased four times.

# "Zone Firing" Featured in Grinding Wheel Production

new type of kiln incorporating "zone firing" is now being used at the Carborundum factory, Niagara Falls, New York, in the manufacture of grinding wheels. The kiln was designed by various technical personnel of the Carborundum Co., including members of the Abrasives Division, the Globar Division, and the Refractories Division. The materials used for



Fig. 1—View of charging end of new Globar Tunnel Kiln showing automatic pushing mechanism

the kiln include "Globar" Non-Metallic Heating Elements, "Mullfrax-S" Electric Furnace Mullite, and "Carbofrax" Silicon Carbide Super-Refractory.

The kiln, known as a "Globar" Tunnel Kiln, provides continuous electric firing operation and incorporates "zone firing" methods for scientific



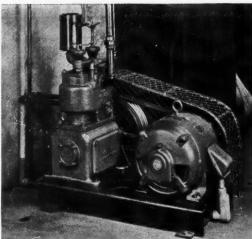
Curtis Timken Bearing Air Compressor. Sizes from 1/4 to 50 H. P., inclusive.

RELIABILITY
That Pays Off
in Low-Cost
Performance

tal-

untric ites

1948



# CURTIS TIMKEN BEARING AIR COMPRESSORS

Every Curtis Air Compressor has been carefully engineered, made of the highest quality materials and precision built throughout.

### **Check These Design Features:**

- Timken Roller Bearings
- Self-Oiling Positive Lubrication
- Carbon-Free Disc Valves
- Automatic Pressure Unloader
- Fully Enclosed Design
- Precision Construction

Capacities from 1/4 to 50 H.P. (up to 300 CFM).

Write today for full information on Curtis Air Compressors, Air Hoists and Air Cylinders.



### PNEUMATIC MACHINERY DIVISION

of Curtis Manufacturing Company

1913 Kienlen Avenue • St. Louis 20, Missouri

94 Years of Precision Manufacturing

1-48-1B

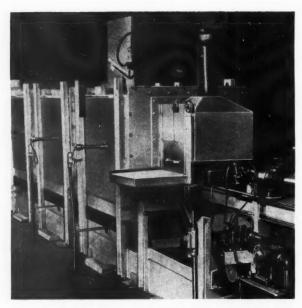


Fig. 2 — Discharge end of Tunnel Kiln showing various control equipment

that the operations of mixing, molding, drying, firing, finishing, packing, and shipping follow in sequence.

### Semi-Automatic Stud-welding

A method for placing more than 200,000 studs on the exteriors of large petroleum dewaxing unit cylinders was recently devised by the engineers

of the Plate Welding Division of General American Transportation Corporation. Thirty dewaxing units, which are ten feet in diameter and which range from 16 to 20 feet in length, are being built for refineries. The studs are used to support external screening on which wax collects as the petroleum-filled drums revolve. Between 6000 to 7000 studs are required on each of the longer cylinders.

A cradle and cradle carriage were designed for the semi-automatic stud-

control of the firing cycle. This control makes possible an increased uniformity of parts, a higher degree of quality, a larger amount of latitude in the development and selection of bonds, and a greater efficiency in production over previous methods. The charging and discharging ends of the kiln may be seen, respectively, in Figs. 1 and 2. Since the installation of the kiln, the company has been able to organize the manufacture of grinding wheels on a "straight line" basis so

# Milwaukee PRECISION TOOLS

Surface plate sizes range from 31/4" x 4" to 48" x 96" to satisfy every measuring need. Highest quality material, a three point bearing, and an exact hand scraped surface are combined for utmost accuracy and durability. Write for your free catalog today!

### J. C. BUSCH COMPANY

Engineers and Machinists Since 1907

126 E. Pittsburgh Ave. Milwaukee 4, Wisconsin



of ous of ...... ry-DON CONTRACT ITEM ng, MADE TO ing mirs' Specifications acan exlecydeers of orich ch th, he nal he

C

3ered

ere

ud-

948

get prompt delivery on LYON metal pro YOU FURNISH THE STEEL LYON LL MAKE THE PRODUCT

> Regular delivery of Lyon products either standard or special - is geared to the available supply of sheet steel. But . . .

If you can supply us with 12 to 24 gauge sheet steel, we will buy it from you and promptly ship the pound-for-pound equivalent at regular published prices . . .

EITHER . . . LYON standard products now in production (see partial list below) . . .

OR . . . assemblies, subassemblies, parts, etc., for your product. These would be made to your specifications in gauges from 8 to 30.

## METAL PRODUCTS, INCORPORATED

Offices: 1238 Monroe Avenue, Aurora, Illinois nches and Dealers in All Principal Cities

### A PARTIAL LIST OF LYON PRODUCTS

- Shelving
- LockersWood Working
- Benches
- Economy Locker
- Racks
- Kitchen Cabinets Filing Cabinets
- · Display Equip-

- ment
- · Hanging Cabi-
- nets
- Cabinet Benches Folding Chairs
- Drawing TablesStorage Cabinets
- Welding Benches Bench Drawers
- Work Benches
- Drawer Units Conveyors
- Shop Boxes
- · Bar Racks · Bin Units
- Tool Stands Service Carts

  - Hopper Bins
  - Parts Cases
  - e flat Drawer Files
- · Tool Trays
- Desks
- Stools
- Tool Boxes Sorting Files
- e Ironing Tables



Application of large quantities of studs to petroleum dewaxing units is speedily accomplished at General American Transportation Corporation by means of the Nelson studwelding equipment shown here.

trolled automatic welding cycle is said to guarantee unimpaired weld strength; the rapid welding action and localized heating effect lessen the possibility of warpage which might result from the use of conventional welding methods.

After studwelding, a milling head is mounted on the cradle carriage for the purpose of finishing the stud ends.

welding of the long rows of  $\frac{\pi}{16}$  in. diameter x 1 in. long studs. As may be seen in the illustration, a four pound Nelson studwelding gun is mounted on the carriage which is indexed along the cradle track to affix studs on  $3\frac{1}{4}$  in. centers. A flux-filled Nelson stud is chucked in the gun, automatic welding is completed at the pull of the gun's trigger, and the carriage is moved to the next position. Up to four studs per minute may be welded; and when one row is completed, the cylinder is revolved on trunnions for the positioning of the next row of studs. A timer con-

### Michigan Shear-Speed Gear Shaper Increases Production of Clutch Gears

A N increased output of cast iron transmission clutch gears is reported by executives of an automotive transmission plant. This improved production has been made possible through the installation of a single spindle gear cutting machine. The machine, a Michigan Tool Company Shear-Speed gear shaper, uses no coolant and cuts, simultaneously, all of the

### FASTER TUBE AND PIPE CUTTING

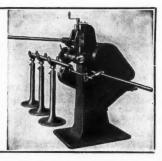
STEEN High-Speed pipe, tube and column autoff machines embody unique design and rigid construction features to greatly step up autoff operations. Available in three sizes to aut diameters 1/s" to 3"; 1/s" to 6"; 3" to 12".

Write for Circular Today

### CONTINENTAL MACHINE CO.

1952 Maud Ave.

Chicago 14, III.





THE RECORDS PLAYED IN THESE MACHINES, OR ON YOUR HOME PHONOGRAPH, ARE ALSO PROCESSED WITH SANDPAPER. WHEN RECORDS COME OUT OF THE PRESSING MACHINES, THE FLASH ON THE EDGES IS SANDED OFF... IN MANY CASES WITH A JEWEL FLINT PAPER SPECIALLY DESIGNED FOR THE JOB. THIS PAPER, WHICH HAS AN EXTRA HEAVY BACKING, CUT SANDING COSTS OVER 80% FOR ONE RECORD COMPANY.

AND A MANUFACTURER OF TROMBONES HAS FOUND THAT A VERY FINE GRIT JEWELOX CLOTH IS IDEAL FOR HAND POLISHING TROMBONE SLIDES.

SO REMEMBER JEWEL WHEN YOU ORDER COATED ABRASIVES. THERE'S A JEWEL PRODUCT FOR EVERY SANDING, POLISHING AND GRINDING NEED. AND PROPERLY USED JEWEL ABRASIVES WILLSPEED YOUR WORK, CUT YOUR COSTS!



ts al

nne

0-

n

re

ie

g

1-

96

rs.

IT

on eve ded le le ne ny

1e



Fifty-one teeth of clutch gear are cut simultaneously in 33 seconds.

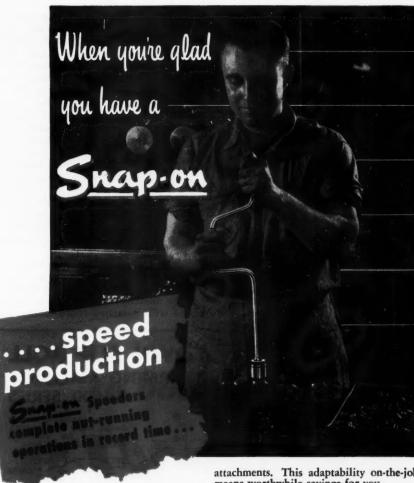
teeth of the 4 in. diameter, 51 tooth,  $1\frac{1}{2}$  in. face width clutches. The time required is 33 seconds (45 seconds floor-to-floor).

The cutting is accomplished as the head of the machine is lowered to po-

sition and 51 tools assembled in the head and are fed radially into the work. The form of the cutting edge of each high speed steel tool is an exact duplicate (in reverse) of the space which

is reproduced. A heavy feed used at the beginning of the cut is gradually decreased on each cutting stroke to balance the load on the machine and to improve finishing accuracy. The tools are withdrawn slightly at the





IOU and your mechanics receive continuing dividends from use of the right tools for each job . . . dividends in greater speed, precision, safety, and lowered production costs. You will find the right wrench for every nut turning job in the complete Snap-on line. Most of them are quickly adaptable to a variety of jobs by interchanging handles, sockets and

attachments. This adaptability on-the-job means worthwhile savings for you.

Snap-on tools are available through 40 direct factory branches located in key industrial areas. Write for address of Snapon branch nearest you.



SNAP-ON TOOLS CORPORATION

8032-L 28th AVE., KENOSHA, WISCONSIN International Division: Kenosha, Wis., U.S.A.

ols he ed he m g gh is te of ch at lly to nd he he end of each cutting stroke to prevent drag on the return stroke. It has been found that tools must be sharpened after each run of 1600 gears. The tools have a negative rake angle of three deg. and are so designed that four different gears (of varying widths) may be machined with the same tooling.

The former output was 368 pieces per eight-hour shift; the present output is 550 pieces per eight-hour shift.

### Carboloy Tipping of Guide-Rest Increases Service Life Between Grinds

XCESSIVE wear on a Mechanite L cast iron guide-rest in a circular die roll threader prompted a New England machine tool builder to consider various methods of improving the part. The guide-rest has a function similar to the grinding rest in a centerless grinder. The wear, caused by the rotation of S.A.E. 4140 steel blanks in rolling 7 in.—20—Class 3 thread-5% in. long on S.A.E. 4140 stock, was so severe that it was necessary to regrind the guide-rest to the required flatness after each lot of 9,000 pieces, or about every eight hours. Regrinding was also necessary whenever a scored surface on the tops of the threads reproduced itself on the guide-rest surface. In addition, after each regrind, the guide-rest had to be shimmed up in order to maintain the required dimension from the top of the guide-rest to the centerline of the piece being roll threaded. After several regrinds, the height of the shims caused such instability that the guide rest had to be replaced.

It was found that by tipping the iron guide-rest with Carboloy cemented carbide, as is shown in the diagrammatic sketch, regrind time and setup time were lessened considerably; and



B-600 SERIES A new, improved, modern design, heavy duty machine, engineered for durability. strength, and service.

SELECT THE BEST . . . LOWN Slip Roll Forming Machines are versatile . dependable . . . e a s y to operate.

Write for bulletins!

LOWN Slip Roll Forming Machines are built in a range of sizes from which you can choose the exact unit for your requirements.

## ANGELO FOUNDRY & MACHINE COMPA

SAN ANGELO, TEXAS

Distributors in Most Principal Cities

1000 E. UPTON

from top TOPALITY to bottom

# BAY STATE taps and dies

ON NEARBY SHELVES OF YOUR INDUSTRIAL SUPPLY DISTRIBUTOR

BAY STATE TAP & DIE CO. MANSFIELD, MASS.

948

by eel 3 40 eshe of ht ry

# PHILLIPS Rotomatic Vapor Degreasers

### CONVEYORIZED PERFORMANCE!

- Controlled cleaning Cycle!
- Open top degreaser cost!
- Timed for proper cleaning!
- 75% reclamation of solvent!
- Great economizer of labor!
- No installation costs!



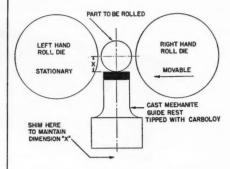


ENGINEERED PHILLSOLV...

the perfect cleaning solvent for all metals or combinations of metals. PHILLSOLV will not affect or stain highly polished surfaces. Send for FREE Booklet "Questions and Answers on Vapor Degreasing".

S MANUFACTURING CO. 3455 Touhy Ave Chicago 45, III

the problem of a marred surface was eliminated since the new surface was so hard that scored threads did not reproduce on it. Production between regrinds rose from the previous average of 9,000 pieces to an average of 74,000 pieces; and, since each regrind



Diagrammatic sketch showing Carboloy-tipped guide-rest

of the Carboloy-tipped surface only removed about .001 in., the job of readjusting the guide-rest was simplified.

Diesel Power. A report recently released by General Motors dramatized the fuel economies promised by the trend toward Diesel engines. One statement said: "If all of the 38,000 steam locomotives in operation on all U.S. railroads were abandoned today and completely replaced by Diesel locomotives, the railroads would use fewer barrels of petroleum products than they now consume in the 6,000 oil-burning steam locomotives glone."

It has been contended in some quarters that the expanding use of Diesel power by the railroads was further accelerating the drain on our diminishing oil reserves. The actual facts were brought out to counteract this misleading notion.

Mention MODERN MACHINE SHOP when writing to advertisers.

WHOW FILES
YOUR FILES
YOUR COSTS'
AND CUT COSTS'

AND cost of the workman's time that counts in
man's time that counts in
filing operations.
filing THESE ADVERTISEMENTS
SAVE

Proposed by Hitchehan File Co.



t

G.P. MACHINIST'S FILE

THE "HAPPY MEDIUM" IN GENERAL PURPOSE FILES
The G.P. (General Purpose), a Nicholson development, is virtually "two files in one." It utilizes
the fundamental principles of the regular Mill
(single cut) and the regular Flat (double cut)
files . . . and combines them to give metalremoving speed with smooth finish.

**USES.** The G.P. Machinist's is not intended to supplant files designed to accomplish a particular filing job in the very best manner and shortest possible time. But to the mechanic working on aluminum, bronze, cast iron, malleable iron, mild steels, or annealed tool steels, it is an excellent, tested general purpose file for hundreds of fabricating and machine-shop jobs.

CONSTRUCTION. The Nicholson G.P. Machinist's File (also made in Black Diamond brand) has the shape of a regular Flat file—except that it does not taper in thickness. Teeth are single cut, but are divided by angular serrations. These produce shorter cutting edges, break up filings—help remove stock rapidly and still leave a smooth finish. Available through your industrial distributor in 8", 10", 12" and 14" lengths.

• FREE BOOK, "FILE FILOSOPHY"-48 interesting pages on kinds, use and care of files. Your foremen need it.



NICHOLSON FILE COMPANY, 48 ACORN ST. PROVIDENCE 1, R. I.

(In Canada, Port Hope, Ont.)



NICHOLSON FILES FOR EVERY PURPOSE



# you can cut you can costs Surfacing with NORTON

### Because They Contain the <u>Right Combination</u>

Each of these surfacing jobs requires a disc with a different combination of abrasive, bond, grain, grade and structure. This combination must be right if the disc is to cut fast and cool, and to have a long, useful life.









### A Choice of Abrasives and Bonds

When you specify NORTON Discs, you have a choice of abrasive, a choice of bond, and a choice of grain, grade and structure. This freedom of choice enables you to obtain a disc of exactly the right combination — a disc with all the properties required to give you a fast, cool cut and extra long life on each of your surfacing jobs.

### Easy to Mount

You'll find that NORTON Discs are easy to mount, too — no cementing is necessary — no return of plates for refilling.

### Engineering Service

Let a NORTON abrasive engineer study your disc grinding jobs. He'll take into consideration the type of disc grinder you're using, the material you're grinding, the size and shape of the work, the amount of stock to be removed, and the finish desired. Then he'll recommend a NORTON Disc of the right combination.

#### NORTON COMPANY

Worcester 6, Mass.

Distributors in All Principal Cities

NORTON ABRASIVES



# ROTARIES IN KITS

make neat presentations to "honor" men



STANDARD KIT No. 40 5 Burs and 5 Files with 1/4" shank.



STANDARD KIT No. 88

18 Burs with 1/8" shank.

OTHER ASSORTMENTS AVAILABLE

With an eye toward building employee good will, many industrial managements make a practice of extending "token recognition" for outstanding service. A kit of Nicholson Rotary Files or Burs makes a fine personal gratuity.

From the following available stocks, your industrial distributor can supply such kits in various standard or special assortments.

HIGH SPEED STEEL – 1/4" SHANK – Hand Cut Rotary Files (used principally on ferrous metals and any scaly, tough, dense surface) come in 16 standard shapes and 3 degrees of coarseness. Ground-from-Solid Burs (used principally for non-ferrous metals and other soft materials) come in 16 standard shapes and 3 degrees of coarseness.

CARBIDE - ¼" SHANK - Ground Bur type only. Made in 9 standard shapes and 3 degrees of coarseness. With up to 100 times the wearing qualities of high-speed steel, Carbide Burs are used principally on long production runs. These Carbides will also cut efficiently on materials such as hardened tool steel.

HIGH SPEED STEEL - 1/8" SHANK - Hand Cut Rotary Files and Ground Burs. Each type available in 18 standard shapes, similar to 1/4" line, and one degree of coarseness. For relatively delicate work.

NICHOLSON FILE CO., 93 ACORN STREET PROVIDENCE 1, RHODE ISLAND

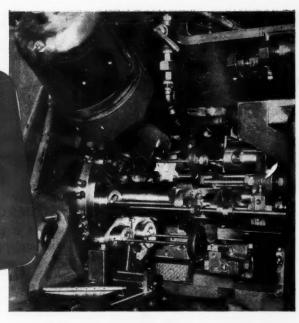
(In Canada, Port Hope, Ont.)

# NICHOLSON ROTARY FILES

HAND CUT AND MACHINE GROUND

HIGH SPEED STEEL AND CARRID

Money-saving
Auxiliaries
can cut your
parts costs



# ... with machining times like this:



#### 11 OPERATIONS - 4.5 SECONDS

You can use *more* attachments on Acme-Gridley Multiple Spindle Automatics. There's plenty of room in the tooling zone for independent power driven auxiliaries. Setup is easy—and chip clearance ample.

Result? More cuts combined, fewer second operations. That means less total machining time, no rehandling time, lower total investment in second operation machines.

May we show you how Acme-Gridley cost cutting figures apply to your needs?

ACME-GRIDLEY BAR and CHUCK-ING AUTOMATICS built in 4, 6 and 8 spindle styles, with positive quick change camming, maintain accuracy at the highest spindle speed and fastest speeds modern cutting tools can withstand.

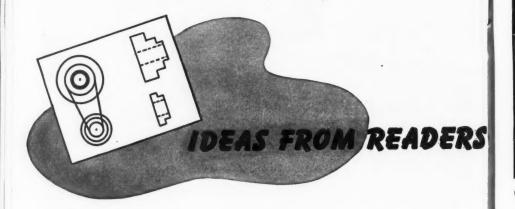


# JOB FACTS

Brass throttle shaft, machined in 11 operations, including milling the flats on both ends, threading, drilling and chamfering the four transverse holes. Machining time on 18 RA 6 Spindle Acme-Gridley bar machine—4.5 seconds.

### THE NATIONAL ACME COMPANY

170 EAST 131st STREET CLEVELAND 8, OHIO



# Clamping and Drilling Grip

By E. R. YARHAM

CLAMPING and drilling grip has been devised for aligning rivet or bolt holes in flat plates which are to be riveted or bolted together. The grip is used for locating and drilling holes in one of two plates when holes in the other plate have been drilled previously. The example to be cited is that of a cover plate, in which holes are drilled and countersunk, that is to be bolted to an angle member. The parts named may be seen in the accompanying illustration.

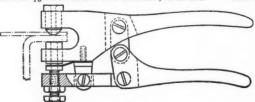
A drill bushing, flanged at its upper end and conical at its lower end, is located in the upper jaw of the grip. In the lower jaw of the grip, along the same centerline as the drill bushing, there is a sliding bushing. An annular ring is machined in this latter bushing about in inch from the bottom, and the

forked end of a flat spring is fitted into this groove. A short rocker arm which carries an adjusting screw that bears on the sliding bushing and controls its position is pivoted on a lug screwed into the frame. The opposite end of the rocker arm is screwed into the bottom handle which is connected to the upper handle by means of a toggle link.

In operation, after the cover plate is located properly on top of the angle member, the conical end of the drill bushing is placed in a countersunk hole in the plate. The handles are then closed. The plate is thus gripped to the angle member, the adjusting screw having been set previously so that the toggle link locks the tool in this position without further support. A drill is then inserted through the drill bushing in order to drill a hole in the angle member.

Advantages claimed for the grip are

(1) the holes are drilled normal to the mating surfaces and are in line with the



Grip designed for locating and gripping rivet and bolt holes.



December, 1948

tted

hat

on-

lug

site

nto

ted

og-

e is

gle

rill

ınk

nen

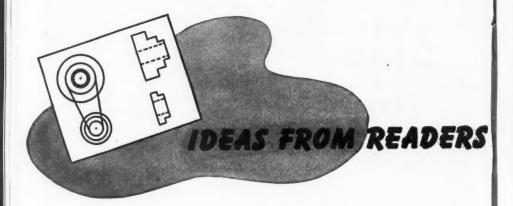
to

osil is ing gle are orces the

rip-

48

the



# Clamping and Drilling Grip

By E. R. YARHAM

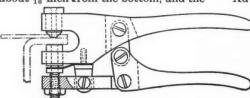
CLAMPING and drilling grip has been devised for aligning rivet or bolt holes in flat plates which are to be riveted or bolted together. The grip is used for locating and drilling holes in one of two plates when holes in the other plate have been drilled previously. The example to be cited is that of a cover plate, in which holes are drilled and countersunk, that is to be bolted to an angle member. The parts named may be seen in the accompanying illustration.

A drill bushing, flanged at its upper end and conical at its lower end, is located in the upper jaw of the grip. In the lower jaw of the grip, along the same centerline as the drill bushing, there is a sliding bushing. An annular ring is machined in this latter bushing about  $\frac{1}{10}$  inch from the bottom, and the

forked end of a flat spring is fitted into this groove. A short rocker arm which carries an adjusting screw that bears on the sliding bushing and controls its position is pivoted on a lug screwed into the frame. The opposite end of the rocker arm is screwed into the bottom handle which is connected to the upper handle by means of a toggle link.

In operation, after the cover plate is located properly on top of the angle member, the conical end of the drill bushing is placed in a countersunk hole in the plate. The handles are then closed. The plate is thus gripped to the angle member, the adjusting screw having been set previously so that the toggle link locks the tool in this position without further support. A drill is then inserted through the drill bushing in order to drill a hole in the angle member.

Advantages claimed for the grip are
(1) the holes are drilled normal to the mating surfaces and are in line with the



Grip designed for locating and gripping rivet and bolt holes.



ed rm

at

n-

ug

ite

to

ed

g-

is

le

ill

ık

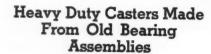
en

to

w

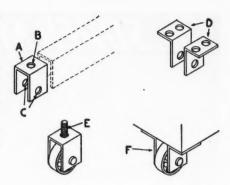
iis gle eeecountersunk holes in the plate, and (2) drill chips are prevented from entering between the plates since the plates are gripped together so tightly.

If the grip is used with parts in which drilled holes are not countersunk, a bushing with a flat end may be used in the upper jaw. The hole in the lower plate should then be located by inserting a dowel through the bushing into the hole in the top plate prior to gripping the handles of the tool.



By A. H. WAYCHOFF

STRONG, serviceable, heavy duty casters that give good performance under heavy loads may be made easily and quickly with parts from old



Heavy duty caster parts and assemblies

ball bearing assemblies. For movement in all horizontal directions, a channel-type caster assembly is used. A suitable length of channel iron is sawed off, as shown at A in the sketch herewith; or, if preferred, a yoke may be bent from strap iron. A hole B, is drilled through the top of the yoke for

po

sta

20

# PRECISION ROTARY TABLES



9"—\$ 97.00 12"— 175.00

15"- 195.00

18"- 235.00

18"— 365.00 Extra Heavy Duty

21"— 510.00 Extra Heavy Duty 25"— 600.00 Extra Heavy Duty

OUR ROTARY TABLE WILL TAKE THE PLACE OF A COSTLY FIXTURE. IT IS USED FOR ALL KINDS OF WORK ON MILLING MACHINES, SHAPERS, DRILL PRESSES AND HORIZONTAL BORING MILLS.

IN STOCK

Special Throad Tops & Dies, Left Hand Tops & Dies. Plug & Ring Throad Gages. Drills, Reamers, Milling Cutters, End Mills, Etc.

WE CAN ALSO FURNISH DIVIDING ATTACHMENTS.

Send for Literature and Details.

IMMEDIATE DELIVERY

Send For 200 Page Catalog

LAFAYETTE TOOL & SUPPLY CO.

128 LAFAYETTE STREET

NEW YORK 13, N. Y.

TOOLS OF 1001 USES GRIND, DRILL, POLISH, CARVE, SAND CLEAN, SAW, CARVE, SAND CLEAN, SAW, CARVE, Stone, Horn, ENGRAVE, on Metals, Alloys, Wood, Plastics, Stone, Plug in any AC or DC socket.

For Work on Metals, Plug in any AC or DC socket.

### HANDEE 44

A good production tool. Has everything—speed, power, versatility and pencil-point precision. Constantly cooled by forced air, the 44 runs cool and smooth all day long. Weighs 2 lbs. 8½" long. 20,000 r.p.m. \$31.50. In wood case with accessories \$42.50.

# HANDEE

A big fellow. Fast, powerful, sturdy, for continuous work. Has ample power to drive a 2½" diam. wheel. Weighs 3 lbs. 10" long. 17,000 r.p.m. In case with accessories \$42.50.

# HANDEE

First tool of this type—today's finest. For precision work. Also gets into hard-to-reach places to make machinery repairs. Weighs 12 oz. 6½" long. 25,000 r.p.m. With 7 accessories \$20.50. Handee with 40 accessories in case \$27.50.

### CHICAGO ACCESSORIES

Grinding and mounted wheels, sanders, steel cutters, etc.—the most complete line to fit any power tool — over 500 of finest quality — all made in our own plant.

HANDEE TOOLS and ACCESSORIES are in stock in principal Industrial areas.

Write for catalog.			
Send Handee 44 Hi-Power Handee Remittance	CHICAGO WHEEL & MFG. CO., 1101 W. Menroe St., Dept. MM, Chicage 7, III		
enclosed	Name		
Send C.O.D. Send Catalog	Address		

CASE REPORT No. 52 from a series of actual cases recording the successful application of "BEAR" DY-NAMIC BALANCING to industry.

# Dy-Namic Balance





# FREE MANUAL tells you how!

340-R, blower wheels ranging in size from 5" to 9" diameter, are

balanced in an average time of 1 minute 42 seconds Result:

Much quieter and smoother oil burner performance!

You can obtain improved product performance and elimination of noise and vibration at lower cost through this faster "Bear" Dy-Namic Balancing Method. Lower initial capital investment and a low cost-per-unit are made possible by this revolutionary "Bear" Method. With "Bear", Dy-Namic Balancing is speeded up to a point where the operation hardly interrupts routine production...simplified to a point where men and women learn to Dy-Namically Balance rotating parts in just a few hours.

Send now for this FREE fact-packed 22-page Dy-Namic Balancing Manual for rotating parts weighing from 4 oz. to 8 tons! Write: Bear Mfg. Co., Dept. M-25, Rock Island, Illinois.

STATIC AND DY-NAMIC **BALANCING MACHINES** 

bolt attachment with the part requiring the caster; and two holes, C, are drilled to accommodate the axle on which the ball bearing roller is located. The bolt head is placed inside the yoke, and the bolt serves as a swivel so that the caster may be moved in any direction. This may be seen at E in the assembly view. For limited movement, two pieces of angle iron are used to hold the roller. Three holes are drilled in each angle, two for bolt attachment as at D, and one for the roller axle. The assembled caster is shown at F.

Both methods of mounting a ball bearing roller provide casters which carry heavy loads yet are moved easily and which are simple and inexpensive to make.

# Setting of Drilling and Tapping Stops Aided by Use of Setting Button

By HERBERT WEITZ

**CETTING** blocks have long been used on milling fixtures to serve as fixed reference points. The accompanying sketch shows how a setting button may also be incorporated into a drill jig in order to maintain a constant reference point when setting drilling and tapping stops for workpieces containing blind tapped holes.

The button is made of drill rod. The lower portion is turned down so that it may be pressed into the jig base or into any other convenient fixed surface in a similar plane on the jig. A step is milled in the upper surface of the button to a depth equal to the safety margin allowed between the thread end and the drill bottom in the part to be tapped.

In setting the drilling stop, the drill is fed in until that part of the drill which first cuts a full diameter is in the same horizontal plane as that of

Trade Mark Reg U. S. Pat. Off

for

the

Gr

Gr

mi

ab

an

th

th

Co

P.

De



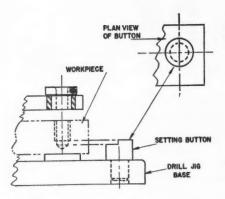
A new standard of quality and uniformity has been pioneered by P-K in the quantity production of Cold-forged Ground Thread Socket Set Screws. Ground on hardened blanks, threads are mirror-smooth, assure uniform, dependable Class 3 Fit. Free from nicks, burrs and hardening scale, they have none of the imperfections common to cut threads.

Compare! Ask for Samples. See why P-K Ground Thread Socket Set Screws are different from ordinary set screws as

AVAILABLE FOR PROMPT DELIVERY

night and day. You'll agree your products will benefit—assembly-wise and sales-wise! Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

PARKER-KALON
WHEN GOOD DESIGN CALLS FOR
SOCKET SCREWS
SOLD ONLY BY ACCREDITED DISTRIBUTORS



Setting button designed to gid in setting stops for drilling and tapping blind holes.

the lower step of the button. Similarly, the tap stop is set when the first full effective thread lies in the same horizontal plane as that of the top surface of the button.

The installation of this type of set-

ting button on a drill jig reduces to a minimum the number of taps that may be broken.

# Method of Beading Small Diameter Tubes

By BARTLETT WEST

SIMPLE and effective device for beading small diameter tubes has been designed so that it may be mounted on a standard bench vise. A schematic cross section of the device is shown in the accompanying illustra-

Two jaws A and B, the former replacing a jaw of a bench vise, are hinged to crosspiece C. Compression springs hold the jaws open when the vise jaws are separated. The jaws carry a pair of blocks, D and E. Each block is bored to take half of the tube to be beaded and formed on the inside



# You Need Only 1 DORMAN TAPPER

## **AUTOMATIC REVERSE**

. instead of 3 ordinary tappers to tap No. 2-56 to 3/8" in steel!

## Plus additional advantages

No Collets to get lost or need replacement.
 Floating Chuck Jaw and Adjustable Friction Drive

to prevent tap breakage.

3. No Pressure required to operate, makes a perfect thread (class 4 fit) possible.

4. Compact, Light Weight Aluminum Housing, occupies

absolute minimum for tap capacity.

5. Furnished with Quill Clamp for rigidity or M. Taper

Shank for quick change.
6. Low Price—No. 1 Size M. T. S. \$44.00.

#### LARGER SIZES — POSITIVE

2-A Cap. 3/4" to 3/4" in Steel. 3-A Cap. 1/2" to 11/4" in Steel 4-A Cap. 3/4" to 2" in Steel incl. pipe taps

ALL UNITS EFFICIENT AS PRODUCTION THREADERS USING BUTTON ACORN DIES

Write for Bulletin

TOOL WORKS 36 S. Mac Questen Parkway, Mount Vernon, N. Y



Dec





# Let Besly's "HELPING HAND" Give You Better Threading — at Lower Cost!

Problems involved in threading materials which are highly abrasive or have a tendency to "close in" after tapping require more than ordinary tap engineering. Through intensive research on these jobs, Besly can now provide specially treated taps that assure clean, accurate threading of such materials

at the lowest possible cost.

Check the chart below—see how many of your tapping problems demand the qualities specifically provided by specially treated taps. Then check with your nearest Besly distributor today. He'll be glad to lend a "Helping Hand"—without obligation.

Besly's specially treated taps for threading plastics, abrasive materials, die castings, etc. give:

Ties.

e

e

S

h

Write for this FREE Tap Manual Today!

You'll Do BETTER

BESLY

treatment to increase tap life.

Abrasive Resistance
Special Surface

To accept gauge after plating.

Free Cutting

work.

With power screwdrivers.

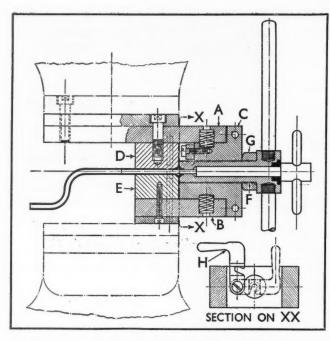
Besly's "HELPING HAND" Has 5 Strong Fingers



- Fast Delivery
- A Complete Line
   Top Tap Quality
  - Engineering Counsel
- Qualified Distributors

BESLY TAPS + BESLY TITAN ABRASIVE WHEELS BESLY GRINDERS AND ACCESSORIES

CHARLES M. BESLY & COMPANY \* 118-124 North Clinton Street, Chicage 6, Illinois Factory: Balait, Wisconin



Device designed to bead small diameter tubes.

into its bore to prevent collapse of the metal on beading. A hinged stop, H, is provided to locate the tube properly.

The sequence of operations in producing a bead on a tube is as follows: Jaws A and B are opened, screw F is retracted within crosspiece C, the hinged stop, H, is lowered, as shown by the chain dotted line in section X-X, and the tube

is pushed over the end of the mandrel until it bears against the stop. The jaws are then closed to grip the tube, and the hinged stop is raised. Screw **F** is turned by means of the two handles until its formed end contacts the tube, the continued pressure on the screw forces the end of the tube body into the cavities formed in blocks **D** and **E** and in the end face of the screw. The screw is turned until stop **G** bears against the crosspiece **C**. The bead is then completed; the mandrel is withdrawn from the tube, and the jaws are opened.

end of the bore to serve as part of the die for the bead diameter. A screw F, threaded through crosspiece C is formed at its free end to provide the remaining portion of the bead die. This screw is turned by a pair of handles, and its movement is limited by stop G. The screw is also bored to take a plain cylindrical mandrel which extends into the tube being beaded and fits closely



### GRAY TURRET HEAD METAL CUTTER OR NIBBLER

N.A.M. Pioneer Award Given to Gray

Most modern Nibbler for Template Cutting, Tool Rooms, Shipbuilding, Aircraft Parts, Aircraft Tubing, Sheet & Plate Shops.

GRAY MACHINE CO. Box 596, Philadelphia, Pa. Surface Finish Standards. A six-page two-color bulletin illustrating and describing machine cut surface finish standards for surface quality control has been released by the Edward Blake Co., 437 Cherry St., West Newton 65, Mass. Copy of Bulletin No. 1048 is available free upon request.

LW

to

to se on ed rine of o-

l-id, c-e is n

n

e

1-

0.

p

1.

0

S

e

D

7.

s

-

n

NEW MODEL

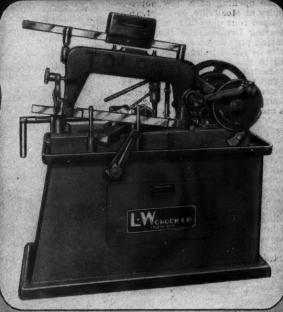
HIGH SPEED

# POWER LIVER SAWS

\$250<sup>15</sup>

All steel welded base and table top Belt drive Rigid frame Gravity feed Length gauge Expanding clutch Swivel Vise

3-speed (90 to 130 r.p.m.) V-belt motor drive arrangement, which assures maximum power transmission efficiency . . \$25.90 less meter. ½ H.P. 1725 r.p.m. motor recommended.



● Stops automatically on completion of cut. ● Automatic relief of saw blade on non-cutting stroke. ● 6"x 6" capacity using 10" x 14" blades. ● 12" x 3" clutch pulley. ● Pulley speed 120 r. p. m. ● Coolant pump inside of base. ● Swivel vise permits cutting at various angles. ● Sliding bearing is dovetailed to fit arm and is adjustable in all directions.

Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products













L-W CHUCK COMPANY

28 SO. ST. CLAIR ST. TOLEDO 4, OHIO

# News of the Industry

### **New National Bearing Foundry**

The National Bearing Division of American Brake Shoe Company has announced the opening of a new non-ferrous foundry at Meadville, Pennsylvania. Having closed four old plants in the National Bearing Division, the company is concentrating production for the Eastern area in the new Meadville foundry.

Located in the heart of the country's steel producing area, the new plant, when in full production, will greatly exceed the combined productive capacities of the four old plants and will provide complete machining facilities which were not available in any of the old plants. The new plant has a total of 185,245 square feet of floor space or the equivalent of nearly 4½ acres under one roof. This includes a two-story office and employee building; the main foundry building and machine shop, which measures 735 x 250 feet; and a heating plant housed in a separate unit.

The two-story office and employee service building houses a fully-equipped dispensary; lunch, wash, and locker rooms for employees; a metallurgical laboratory; a chemical laboratory; the engineering department; and general offices. The

plant employs 450 people.

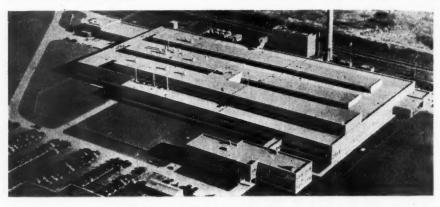
# Five Point Program Suggested for Machine Tool Industry

In the event of a war emergency, the American machine tool industry could not attain the rate of operations required on behalf of prompt industrial mobilization within much less than six months' time, A. G. Bryant, past president of the National Machine Tool Builders Association, told members at the association's annual meeting recently.

Pointing out that the National Security Resources Board program calls for the building of 100,000 machine tools within twelve months following the emergency, Bryant said that advance notice to manufacturers of the task committed to them has great value, but would be an empty gesture without assurance that the program could be promptly and adequately met.

"The American machine tool industry," Bryant said, "has, since the peak of the wartime production rate, reduced its capacity to one-third of the maximum, yet it has been operating now for over two years at a level of about one-half of its reduced capacity.

"The industry first suffered from the smothering effect of the absorption of its



Aerial View of New National Bearing Foundry

# UNISORB MOUNTING

the Modern Way to Anchor Machines
Without Floor Damage

No Boits

minimum, which absolutely prevents riding. Besides providing the easiest of all machine installation methods, UNISORB absorbs from 60% to 85% of transmitted vibration and noise. Write for a sample and details now.

Almost every kind of machine can be anchored the modern way —on UNISORB... on flooring of any type. No bolts. No lag screws. No destructive floor drilling.

A special cement binds the UNISORB pads to the machine feet and the floor with a holding strength of 1500 lbs. per square foot



### THE FELTERS COMPANY

210-L SOUTH STREET, BOSTON 11, MASSACHUSETTS

Offices: New York, Philadelphia, Chicago, Detroit
Sales Representatives: San Francisco, St. Louis
Mills: Johnson City. New York; Millbury, Mass.; Jackson, Mich.

d

postwar market by the disposal of war surplus machines. Then its sales were restricted by the effect of unsound taxation policies and unwise depreciation practices upon its customers. Now for over a year one-fifth of its volume, which for decades it has customarily shipped abroad, has been taken away by the influence of the dollar shortage in the countries of its foreign customers.

"Machine tool builders have had to let their working forces dwindle and there are no available reserves of skilled workmen that could be immediately tapped for a rebuilding of working shifts to a basis of normal operations. Supplies of steel, castings, scrap, pig iron and other essentials are on such a scanty basis that months would be required to get machine tool production in the average plant on a basis satisfactory in an emergency. Engineering staffs have been reduced not only because competent men are unavailable but because of the drastically reduced basis of operations, machine tool companies cannot afford to support research and engineering development at the right level.

"The industry believes in no subsidies or artificial stimulants. It wants no help that is not justified by its own services. It asks simply that America and the

world recognize that the maintenance of a healthy industry, a dynamic machine tool industry, is of crucial importance to all people."

Bryant outlined the following fivepoint program for the machine tool in-

dustry:

"1. Engineering Development. The American machine tool industry must be able and willing to continue its research and engineering development calculated to keep its products continuously in a position of supremacy.

"2. National Defense. For the security of our nation, the industry must continue, as in the past, unstintingly to render such advisory assistance to the armed forces as will keep our facilities for the production of defense materiel in a condition of maximum usefulness and dependability.

"3. Effective Selling. It must sell 'the world's best investment'—machine tools—as the machines which will provide more goods for more people at lower cost.

"4. Fiscal Policies. As an essential to the maintenance of a high standard of living, it must vigorously urge the enactment and enforcement of such sound policies of taxation, repricing and amor-



THE WARDWELL
MANUFACTURING CO.
3166 FULTON ROAD
CLEVELAND 9, OHIO

# Carbide Drills Fluted from Solid

...indexes automatically

# Grinds and Sharpens Taps — Reamers Milling Cutters — End Mills Saws

Grinding angles up to  $45^{\circ}$ . Spiral leads as short as 5/16'' to one turn. Sharpens saws in gangs up to 73/4'' long.

Write for Bulletin 90 F.S.

Re

sp

ch



This is the only lathe of its size, type, and price equipped with Timken Tapered Roller Bearings.

These Timken bearings enable the Atlas to handle high speed jobs such as metal spinning, wood turning, and plastics machining as well as all metal turning work at normal speeds. They maintain spindle alignment-carry radial and thrust loads with low friction - assure enduring accuracy and lower maintenance.

In addition, there's the Atlas "Quick-Change" feature that slashes costly set-up time with instant selection of 54 threads and feeds, 16 spindle speeds from 28 to 2072 RPM provide a wide working range for handling jobs quickly, accurately, and economically.

The new "Quick-Change" lathe catalog gives the facts and specifications. Send for it. See how the "built-for-wear" Atlas can save you money and speed production.

# ATLAS PRESS CO.

1246 N. Pitcher St., Kalamazoo, Mich.



to

e

h d

e, er



Architectural Sketch of New Cimcool Plant

tization as will encourage business to expand to furnish more employment and produce more goods more economically.

"5. Export Markets. It must continue to cooperate with such agencies as ECA and must make clear that ECA cannot function with true effectiveness unless it is supported by a foreign policy of our government which will provide a degree of direction to the use of our loans and grants."

# New Plant for the Manufacture of Cimcool

A modern self-contained plant is being erected on the grounds of The Cincinnati Milling Machine Co., Cincinnati, Ohio, for its Cimcool cutting fluid division. The latest methods and equipment, including many new innovations, will be employed in the handling of the raw material, blending and compounding, mixing, fil-



# LET THE "HOSSFELD"



# **Universal Iron Bender**

Solve Your Bending Problems.

Bends Angle Iron with Flange Inward or Outward— Flats and Rounds to Various Shapes. Also Pipe up to 2" Cold.

- WRITE FOR LITERATURE TODAY -

# Hossfeld Manufacturing Co.

460-62 W. THIRD ST.

WINONA, MINNESOTA

# FIRTHITE SINTERED CARBIDE,

# USED in your shop tooling -more rapid removal of material -increased production runs -better finisher

- cutting of so-called unmachinable materials
  - -holding of closer tolerances
    - longer tool and die life
- . . . all of which adds up to higher production at lower costs

ing

ati for

The

ing red ial,

fil-

FOR LATEST CATALOG CONTAINING DATA ON

FIRTHITE SINTERED CARBIDE CUTTING TIPS. TOOLS

#### AND SPECIALTIES

This new catalog, just off the press, contains information on the most recent developments in Firthite carbides and describes forms supplied and grades available for cutting tools, special tools and wear parts.

Your copy is ready—sign and mail the coupon.

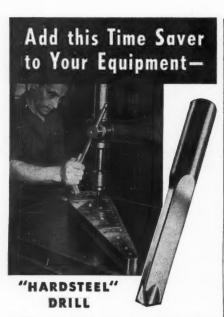




#### Firth Sterling Steel & Carbide Corporation McKeesport, Pennsylvania

Please send me your new catalog, "Firthite Sintered Carbide Tips, Tools and Specialties."

NAME	
TITLE	
COMPANY	
ADDRESS	
9	



 When last minute changes come through on hardened parts and dies—drill without annealing using "HARDSTEEL" drills—and save time.

When parts must positively match at assembly —harden first, then drill with "HARDSTEEL" drills—and save time.

When case hardened steels must be drilled, use "HARDSTEEL" drills to get through the case—and save time.

Yes, "HARDSTEEL" drills, made of special material and to a special design eliminate all annealing and the distortion usually caused by rehardening. They work on steels hardened by any process to 40 Rockwell "C" or harder.

The "HARDSTEEL" Operators Manual will give you many tips on how this well known tool can save time and material in your plant. Copy free on request.

You Harden It — We'll Drill It — with "HARDSTEEL"

"HARDSTEEL" Tool bits make faster, deeper cuts on steels and non-ferrous alloys.

BLACK DRILL CO., Division Black Industries 1372 East 222nd Street + Cleveland 17, Ohio

"HARDSTEEL"

ling the containers, and transferring the containers to the shipping facilities.

Steel, brick, glass, glass block, and insulated aluminum panels are the principal building materials employed in the one-story structure. Careful planning has been given the various components to provide the best possible, working conditions. The proper amount of light—both artificial and natural—is obtained by the use of glare reducing glass and light diffusing glass block in combination.

#### Southern Supply and Machinery Distributors' Association Mid-Year Meeting

The Southern Supply and Machinery Distributor's Association, Inc., 208 Peachtree Arcade, Atlanta, Ga., announces that its Industrial Distribution Forum and Mid-Year Meeting will be held at the Edgewater Gulf Hotel, Biloxi, Mississippl, on January 13 and 14, 1949. The Forum will be held on Thursday, January 13, with a banquet in the evening for all members, manufacturers and ladies. The Mid-Year Meeting will be conducted on the morning of Friday, January 14. The social events in connection with the meeting are planned to include the ladies.

Requests for reservations should be made directly to the Edgewater Gulf Hotel, addressed to the attention of Mr. A. P. Shoemaker, Jr., Manager.

#### Michigan Abrasive Moves Fabricating Facilities

In order to provide additional floor space required by business expansion, the Michigan Abrasive Co., Detroit, Mich., has recently moved its complete fabricating facilities and general offices into two new buildings at 2360 West Jefferson Avenue. Formal opening of the new plants was celebrated with an Open House where customers and friends, between refreshments, dinner, and entertainment, inspected new high capacity ovens and other equipment for manufacturing resin-bonded industrial abrasives.

In addition to Max C. Jones, president, other Michigan Abrasive officers present at the Open House included Frederick P. Hauck, vice president in charge of manufacturing; C. H. Wills, general sales manager; Louis F. Guetschow, assistant secretary - treasurer; and Robert O. Blackford, advertising and sales promotion manager.

Sm

an

Have you a
"SMALL
PARTS"
Filing Job?



# Use "AMERICAN SWISS" Swiss-Pattern Files

Small fillets, holes, slots, curves, edges and surfaces may seem to be trouble-some filing jobs—but not if you use "American Swiss" Swiss-Pattern Files. When you standardize on this extensive line of precision tools, you have a selection of more than 3000 different shapes, cuts and sizes to choose from —including widths and diameters as

small as 1/16", thicknesses as small as 22 B&S, and cuts as fine as 200 or more teeth per inch. So, for "small parts" filing, as well as for all accurate or finishing filing, use "American Swiss" files—they will help you do better, faster, more economical work.

**Buy From Our Local Distributor** 

AMERICAN SWISS FILE & TOOL CO., 410 Trumbull St., Elizabeth 1, N.J.

ask for them By this NAME and Swiss &

SWISS PATTERN FILES

#### N.M.T.B.A. Announces New Officers and Directors

Lloyd D. McDonald, vice president of The Warner & Swasey Co., Cleveland, Ohio, took office as president of the National Machine Tool Builders' Association at the conclusion of its 47th annual meeting held recently at Atlantic City. Mr. McDonald has been first vice president of the association and has served twenty-nine years with The Warner & Swasey Company. He has been active on committees of the American Management Association, the Chamber of Commerce of the United States, the National Association of Manufacturers, and an Industry Member of the Fifth Regional War Labor Board.

David Ayr, president, The Hendey Machine Co., Torrington, Conn., was advanced from second vice president to first vice president, and Richard E. Le-Blond, president, The R. K. LeBlond Machine Tool Co., Cincinnati, Ohio, took office as second vice president. Louis Polk, president, The Sheffield Corp., Dayton, Ohio, was reelected treasurer.

New directors for a three-year term include Ralph J. Kraut, president and general manager, Giddings and Lewis

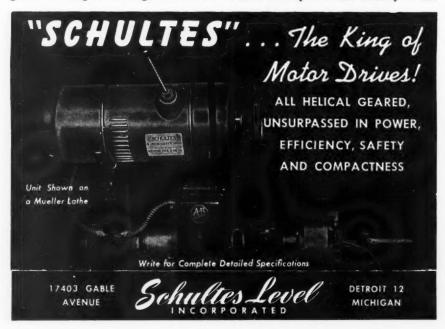
Machine Tool Co., Fond du Lac., Wis., and Alfred V. Bodine, president and treasurer, The Bodine Corp., Bridgeport, Conn. Mrs. Frieda F. Selbert was again named secretary.

In addition to the officers and new directors, the board includes Herbert L. Tigges, executive vice president, Baker Brothers, Inc., Toledo, Ohio; Milburn A. Hollengreen, president, Landis Tool Co., Waynesboro, Pa.; and Harold B. Smith, president, Illinois Tool Works, Chicago, Illinois.

# Council for Technological Advancement

Formation of a new Council for Technological Advancement made up of 75 top-flight nationally known industrial executives has been announced by William J. Kelly, president of the Machinery & Allied Products Institute, 120 S. LaSalle St., Chicago 3, Ill., a study and research organization.

The basic purpose of the new council, Mr. Kelly said, is to create better understanding among American businessmen and the people generally of the part technological advancement must play in the future development and security of the



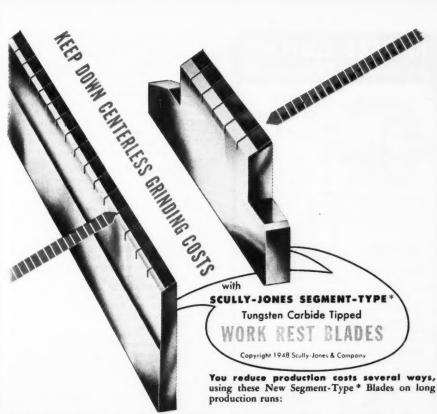
bec

bra wh

oft

of

be



You reduce maintenance costs of the blade, because the short segments resist warping during the brazing process. This avoids any strains in the carbide which may occur when brazing long strips, and which often result in quick failure of the blade.

\*You have less down time, because the harder grade of carbide, used for tipping, gives longer wear and requires only occasional regrinding.

You produce more pieces "to specifications," because the blade will maintain its alignment while in service. You will not mar the work being ground, because the slots between the segments, permit the coolant to wash away any chips and keep temperature of blade at proper efficiency point.

 You save money in reconditioning a blade, because you need only replace damaged segments, not the whole strip.

## IMMEDIATE DELIVERY

of popular sizes, from stock

Write for folder showing complete specifications and prices on this new type of Work Rest Blade.



MT

s., nd rt, in di-L. er A.

h-75 al ilry aeil,

r-

en h-

ne ne

18

# HILLIARD CLUTCHES for Industrial Equipment



HILLIARD
Single Revolution
Clutch

Unequalled for accurate control of intermittent machine operations. Gives closer tol-

erances to cut-off, stamping, shearing, and similar machines. Completely automatic with manual, electrical, or mechanical control.

# HILLIARD Over-Running Clutch





# HILLIARD Slip Clutch

Reliable spring-loaded slip clutches and couplings available in a variety of types. Outstanding for prevent-

ing overloads; for reeling and winding operations; and for many other uses.



Write today — 3 Hilliard Clutch Bulletins with design information. Free on request.

The HILLIARD Corporation

117 W. FOURTH ST.

ELMIRA, N. Y.

country. Among the erroneous conceptions which the council will seek to correct, according to Mr. Kelly, are the following: (1) that corporation profits are too high, as is being vigorously asserted today in some quarters; (2) that too much of industry's income is invested in plant and equipment; (3) that a larger proportion of the income of manufacturing corporations should be distributed in dividends; (4) that all loans for capital equipment should be curtailed; and (5) that technology destroys more jobs than it creates.

The council will be an integral part of the Machinery Institute which was organized in 1933 to develop a better understanding of the basic differences between capital and consumption goods.

"We of the Machinery Institute," Mr. Kelly said, "believe that there is an urgent need to clarify and extend understanding as to the place to be occupied in the economy of the future by dynamic technological development, including the need for maximum productivity and more rapid replacement of capital equipment. There is also urgent need for strengthening our patent system and for restoring an open and free-flowing market for venture capital.

"The work of the Council for Technological Advancement will constitute a long range program. It is self-evident that the technological development of the United States is one of the most vital factors contributing to our future security and progress. It is equally self-evident that advantages of technological advancement will be challenged through lack of understanding in the future as in the past. The council has been organized to meet this challenge and to take advantage of this opportunity to serve the public."

#### Fenn Manufacturing Company Acquires Standard Machinery Company Line

The Fenn Manufacturing Company of Hartford and New Britain, Connecticut, recently announced that it had acquired from the Standard Machinery Co., Providence, R. I., the latter's main line of machinery manufacture. According to W. L. Fenn, president of the company, the new line will put the concern into the manufacture and sale of metal rolling mills, punch presses, swadging machines, Turk heads, and special large diameter bearings. For the time being operations will continue at the Standard



1207 ELSTON AVENUE

CHICAGO 22, ILLINOIS

Other C/R maintenance products are: round, flat and twist belting; belt pins and belt lacings; gears, pinions and gear blanks; aprons and hand leathers; hydraulic packings.

ed ch nt rral 5)

of

n-

e-

r.

r-

r-

ic

re

h-

ror

0-

a

nt

1e

al

ri-

d-

in

d-

ed

of to y,

rd

plant in Providence, however, within a short while the acquired lines will be moved to the Hartford and New Britain plants of The Fenn Manufacturing Com-

During the past 50 years, Fenn has been designing and building special custom machines for the textile, woodworking, paper, ball bearing, telephone, and electrical industries. The company will continue in the sale, service, and manufacture of these machines and with the general policy of distribution now being followed. The Standard lines, which will continue to be built under the Standard Machinery Company's name, will give The Fenn Manufacturing Company its first catalog-type machine products in its history.

### Aldus C. Higgins

Aldus C. Higgins, 75, for nearly a half century closely identified with the Norton Co., Worcester, Mass., died September 10 at his home 1 John Wing Road, Worcester. Mr. Higgins, at the time of his death, was chairman of the Norton Company executive committee. His first Norton employment was as patent counsel, starting July 1, 1900. He had served in

many Norton executive positions, including that of president, general manager, and chairman of the board of directors.

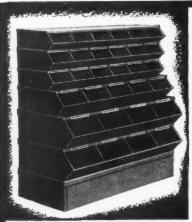
Mr. Higgins was also chairman of the board of Riley Stoker Corporation and a director of Liberty Mutual Insurance Company of Boston, Worcester County Trust Company, Boston & Maine Railroad,



Aldus C. Higgins

Indian Hill Company, and Norton Company of Canada, Limited. He was president and a trustee of Worcester Art Museum, a trustee of the Worcester Memorial Hospital, and a life member of the trustees of Worcester Polytechnic Institute.

Mr. Higgins on his 75th birthday anniversary was honored by the King of Sweden during the annual Norton Company service awards party in the Worcester Memorial Auditorium. He was decorated by the King, through the Swedish Consul - General, with the Royal



# **Auxiliary Stockrooms**

# - Wherever You Need Them!

STACKBIN sections will give you a stockroom wherever you want it—quickly and easily as building a sectional bookcase. These patented sectional storage bins nest together without the use of tools—cost you nothing to build, nothing to move. Find out today how STACKBINS can lower handling costs.

Manufactured and sold in Canada exclusively by Wickware-Stackbin, Ltd., Ottawa

Write Stackbin Corp., 1083 Main St., Pawtucket, R. I.

STACKBIN
"Stacked and



SYSTEM

Still Accessible"



Basing an operator's time at \$1.25 per hour, the average hand feeder can produce a maximum of 2,000 pieces per hour, or only 16,000 pieces per day at a labor cost of \$10 for 16,000 units. The same press equipped with automatic die feeds and running at 123 RPM on a basis of 83% efficiency will produce 48,000 pieces in the same period . . . an actual saving of \$20 per day.

Figuring on this very conservative basis, Dickerman Die Feeds will pay for themselves, out of labor alone, as follows . . . 2" Hitch Feed, 2 days . . . 4" Hitch Feed, 7 days . . . 3" Die Feed in 14 days . . . 6"x 4" Die Feed in 21.2 days and a 6"x 6" Die Feed in 26.2 days. Equally important is the fact that these die feeds can operate for long periods unattended, thereby saving operator's time for other duties.

Write for

f

f

S

# H. E. DICKERMAN MFG. CO. 322-1213 Albany Street - Springfield, Mass.

#### DICKERMAN DISTRIBUTORS

Jamison Steel Corp.

W. C. Chapmon & Son Battimore, Md. Sarataga 5703 Fidelity Tool & Supply Camden, N. J. Camden 4.7765 Phila., Pa. Lombard 3.4482 Federal Machinery Soles Co. Chicago, III. Central 6680 The Die Supply Co. Cleveland, Ohio. UT 1-0550 Deyton, Ohio. Adams 6011 Diemaker Supplies, Inc. Detroit, Mich. Frinity 1-2865 The Standard Die Supply, Inc. Indianapolis, Ind. Riley 5824

Los Angeles, Colif.
Trinity 1826
Trinity 1826
The Satterline Co.
Minneapolis, Minn.
Allonitis 2264
Export Department
401 Broadway, New York, N. Y.
Cable Address UNIONTEX
T. E. Ryer Machinery Co.
15 Molises St., W.
Montreal, Canada
A. R. Williams Machinery
Co., Ltd.
Toronto, Canada
Elain 2381

Colcord-Wright Machinery & Supply Co. 5t. Louis, Mo. Central 6970 Jamison Steel Carp. San Frencisco, Calif. Exbraok 2-2230 Lindeo, Inc. Worcester 3, Mass. 6-4637 Acme-Danneman Co., Inc. Naw Yark, N. Y. Canal 6-1759 R. C. Neal Ca., Inc. Buffalo, N. Y. Cleveland 1110 Offices—Rochester, Elmira, Syracuse

Swedish Order of Vasa, first class, with the rank of Chevalier. The decoration was bestowed in recognition of his outstanding contributions to industry and art.

#### Did You Know? ---

The Boye & Emmes Machine Tool Co., Cincinnati, Ohio, manufacturer of engine lathes, has appointed the Frank A. Meyer Co., 401 N. Broad St., Philadelphia, Pa., as its exclusive sales representatives in eastern Pennsylvania, southern New Jersey, and Delaware, and the Barry & Son Co., 406 W. Franklin St., Baltimore, Md., for the State of Maryland.

The Janette Manufacturing Co., 556 W. Monroe St., Chicago 6, Ill., has announced the appointment of the following agents and representatives: Alton M. Johnson (Minneapolis territory), 220 S. 10th St., Minneapolis 2, Minn.; Bell Steel Sales, Inc., (Milwaukee territory), 606 W. Wisconsin Ave., Milwaukee 3, Wis.; William S. Turner (Michigan territory), 445 New Center Bldg., Detroit, Mich.; and W. F. Hardcastle (Southeastern territory), 609 Walton Bldg., Atlanta, Georgia.

Auto Engraver Co., Inc., 1776 Broadway, New York 19, N. Y., manufacturer of engraving and profiling equipment, has announced the opening of a new department for precision engraving, profiling, and contour milling. The service is extended to the experimental field as well as to the mass production of small instrument parts, cams, dials, and so on, plus the making of molds, dies, and hobs of many types.

The Black & Decker Mfg. Co., Towson 4, Md., has announced that R. A. Wernsdorfer, service engineer in charge of repair and service of electric tools in the Atlanta branch, has been transferred in the same capacity to the Baltimore branch. G. C. Wilhide, Jr. has been appointed service engineer in Atlanta to fill the vacancy left by Mr. Wernsdorfer.

Ernest H. Lauter and George Omelianoff have organized the Progressive Welder Sales Company of Ohio to handle sales
of resistance welding equipment in four
states: eastern Ohio, western Maryland,
western Pennsylvania, and the northern
sections of West Virginia. Headquarters
of the new sales organization is at 4713
Euclid Avenue, Cleveland.





ECONOMY Lubricant 1888 fluid type - water soluble For Grinding and Cutting

Rapid mixing in all waters, clean stock removal, increased production

HE WHITE & BAGLEY COMPANY WORCESTER, MASS. • DETROIT, MICH.

Originators of Grinding Lubricants



#### Did You Know? ---

The Warner & Swasey Co., Cleveland, Ohio, has received one of five product design awards presented annually by the magazine "Electrical Manufacturing" for its new electrically-controlled single-spindle automatic chucking machine. The \$500 cash award which accompanied the citation has been presented by the company to Ralph H. Schuman, designing electrical engineer, who wrote the prize-winning paper describing the machine.

Burgan Machinery Co., 9527 Fifth Ave., Inglewood, Calif., has been reaffirmed by The Cleveland Tapping Machine Co., Hartville, Ohio, as its sales representative in California, Arizona and Nevada. Star Machinery Company, with offices at 1741 First Avenue South, Seattle 4, Washington, East 415 Sprague Avenue, Spokane 8, Washington, and 801 S. W. Front Avenue, Portland 4, Oregon, has been reaffirmed to handle the sale of Cleveland standard and precision production tapping machines in Washington and Oregon.

Establishment of a Cincinnati sales office in the Roselawn Center Building and transfer from Indianapolis to Cincinnati of Frank Heap to head an expanded Cincinnati-Indianapolis sales territory has been announced by Stanley A. Brandenburg sales vice president of The Monarch Machine Tool Co., Sidney, Ohio. Don Potter, formerly assistant to Mr. Heap, assumes charge of the Indianapolis office which is retained in the new territorial setup.

George H. Nye, president of the Circular Tool Co., Inc., Providence, R. I., has announced the appointment of Miles D. Pilon as sales manager effective as of January 1, 1949. Mr. Pilon, who for the past 4 years has handled sales in the Michigan territory, will work directly from the factory. Andrew Spruce has been appointed Michigan representative, replacing Mr. Pilon.

Wheel Trueing Tool Co., Detroit, Mich., has announced the appointment of Arthur J. Baehr as representative in the Pittsburgh area for the wide range of industrial diamonds, standard and special diamond tools manufactured by the Company, as well as its recently introduced Diamond-Miser. Mr. Baehr's business headquarters will be at Chagrin Falls, Ohio,

# SANFORD

# SURFACE

d, ehe

ee. ed

nhe a-

ed

a. a.

at

h-

nt e-

nd p-

e-

fnd ti nas no.

w

as D.

of

1e

ne ly

e,

١.,

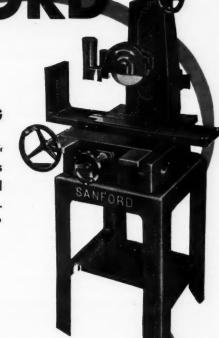
of eie

in

48

Model MG

Handles many odd size tool room and production jobs, due to its capacity of 8" x 12" x 12". Actual movements — Transverse 8¾" — Longitudinal 13" — Vertical 12" (under 7" heel).



# BENCH SURFACE GRINDER

Model 5G

A sensitive, highly accurate magnine specially designed "for the job the fits in your palm."

Actual movements — Transvers 4" — gitudinal 8" — Vertical of (under

WRITE FOR COMPLETE DETAILS

SANFORD MANUFACTURING CO.

1 0 2 1 COMMERCE AVENUE
UNION, NEW JERSEY

#### Did You Know? ---

Raybestos-Manhattan, Inc., Passaic, N. J., has announced the opening of a new modern warehouse and office at 4651 Pacific Blvd., Los Angeles 11, Calif., to service and stock rubber goods and packings for industrial and oil field requirements for southern California.

The Elgin National Watch Company has announced that its Sapphire Products Division located in Aurora, Illinois, is now known as the Industrial Products Division.

A. F. Vinson, formerly assistant production manager, G-E Apparatus Department, and chairman of the G-E Welding Committee, has been appointed manager of General Electric's Welding Divisions, according to H. V. Erben, manager of the Apparatus Department.

Viking Products Co., Inc., 2373 E. Eight Mile Rd., Detroit, Mich., a new company organized to produce automatic air valves, has announced completion of its developmental program and installation of equipment for mass production at its Vicksburg, Michigan, plant.

Detroit International Trading Co., 834 Lafayette Bldg., Detroit 26, Mich., has been appointed exclusive export agent for the "Airlox" line of air vises and hydraulic vises manufactured by Production Devices Inc., Whitehall, New York.

R. E. W. Harrison, vice president of the Chambersburg Engineering Co., Chambersburg, Pa., has resigned to reestablish his consulting service, with headquarters to be set up in New York City. He will specialize in management engineering.

The Interstate Steel Company with headquarters at 308 W. Washington St., Chicago, Ill., has announced a new Philadelphia office at 6701 North Broad Street, headed by Saul Bradburd, long experienced in the field of buying and selling sheet and strip steel, as well as structurals.

James R. Longwell, for the past four years director of engineering and research for the Carboloy Company, Inc., Detroit, has been named assistant to the president, and F. C. Ritner has been appointed vice president in charge of engineering and research, according to W. G. Robbins, Carboloy president.



# CIRCLER



# SCREW SLOTTING SAWS

Used by most of America's larger screw manufacturers, these Circle R saws are made of selected high speed steel. Like all Circular Metal Cutting Tools they are designed by specialists to successfully accomplish the most exacting operations.

Complete stocks of these sizes are available.

For detailed information on these and other Circular Saws send for Catalog L. NOW!



1¾" diameter



21/4" diameter



23/4" diameter



® CIRCULAR TOOL CO., Inc. ®

PROVIDENCE 5, R. I.

CHICAGO . PHILADELPHIA . NEW YORK . DAYTON . CLEVELAND

18

34 as

or yick.
of
o.,
eth
rk
nt

ad

nd as

ur ee-, he

# CHICAGO STEEL PRESS BRAKE

Model No. 131



A new member of the Chicago Press Brake family designed to supplement the larger machines.

Within its rated capacity (11 tons) all operations are handled same as on the larger machines.

All steel construction, enclosed gearing.

Takes up small floor space. We can make excellent deliveries of this new press.

We make complete line of dies for all Press Brakes.

Send for Bulletin 131 for further description

# DREIS & KRUMP MFG. CO.

7418 LOOMIS BLVD. • CHICAGO 36
ILLINOIS

#### Did You Know? ---

The Geometric Tool Co., New Haven 15, Conn., has appointed the Wright Industrial Supply Co., 3630 Detroit Ave., Toledo 12, Ohio, as its distributor for northwestern Ohio.

Scully-Jones and Co., Chicago, Ill., designer and manufacturer of standard and special production tools, has announced the appointment of **Harry Conn** as chief engineer in charge of the company's engineering division.

The Nicholson File Co., Providence 1, R.I., has announced the appointment of J. Clifford Berthiaume as district manager of the Central Western territory, including Chicago, Minneapolis, St. Louis, Kansas City, and Denver.

McBeth Machinery Co., 1109 Grant Bldg., Pittsburgh 19, Pa., Court 5516, has been appointed exclusive representative of the Hauser Machine Tool Corporation, manufacturer of jig borers and other precision machinery, in the Pennsylvania, West Virginia, and Ohio territory.

Scherr Small Tools. The George Scherr Co., Inc., 198-A Lafayette St., New York 12, N. Y., announces the publication of a 28-page small tool catalog presenting its line of micrometers, vernier calipers, height gages, and other tools for toolmakers and mechanics. In addition to the standard line of tools which the company has marketed for many years, the catalog introduces a number of newly developed specialties of interest to men doing precision work. Shown also are the Scherr Magi-Rays, a new dial thickness measure, optical center locator, quartz optical flats, and other products. Moreever, the catalog announces the establishment of a book department for the George Scherr Company which will specialize in useful books for machine shop work. Copy free upon request.

"Modern Die Casting Practice," an article by R. J. Reel, die casting engineer, The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio, is the subject of a 24-page two-color reprint which has been issued by the aforementioned firm. Discussed in detail are practical modern trends of application, various die casting methods, dies and die design, and machinery. Copy free upon request.

## HANNIFIN

Standardized for

1. LOWER COSTS
2. QUICKER DELIVERY

3. SUPERIOR PORMANCE

ALMOST without exception, the hydraulic cylinder you need to fit even your special applications can be found as a standard unit listed in the big 52 page Hannifin catalog. This is your key to LOWER COSTS... QUICKER DELIVERY...SUPERIOR PERFORMANCE. The Hannifin line is complete! All standard and combination mounting styles... bore diameters, 1" to 8"... any length stroke... standard, double end, or heavy duty (2:1) piston rods... with or without cushions.

Model JN HAY DRAULIC

ASK FOR THIS BULLETIN CYLINDERS



Save time and money. Use this 52 page bulletin as a guide for meeting all of your hydraulic cylinder requirements out of a standard line. Ask for Bulletin 110-I.





Model KCN











Nationwide Sales and Service

#### HANNIFIN CORPORATION

1101 50. Kilbourn Ave., Chicago 24, III.
AIR CYLINDERS - HYDRAULIC CYLINDERS - HYDRAULIC PRESSES
PNEUMATIC PRESSES - HYDRAULIC RIVETERS - AIR CONTROL VALVES

#### YOU CAN CUT COSTS THREE WAYS

## with **DISSTON**HACK SAW BLADES

You save in cutting time. You save in down time. You get more cutting from each blade. All add up to increased production . . . lower production costs.

#### DISSTON U.S.A.



DISSTON HIGH SPEED STEEL BLADES saw through metals ordinary blades cannot cut. Use them for stainless steel, chrome-nickel steels and similar alloys.

#### DISSTON MOLYBDENUM HIGH SPEED STEEL Di-Mol U.S.A. 10 TEETH

DISSTON DI-MOL BLADES withstand severe strains and abuse. Use them for cutting tool and machine steels, cast iron, tubing and general machine shop production.



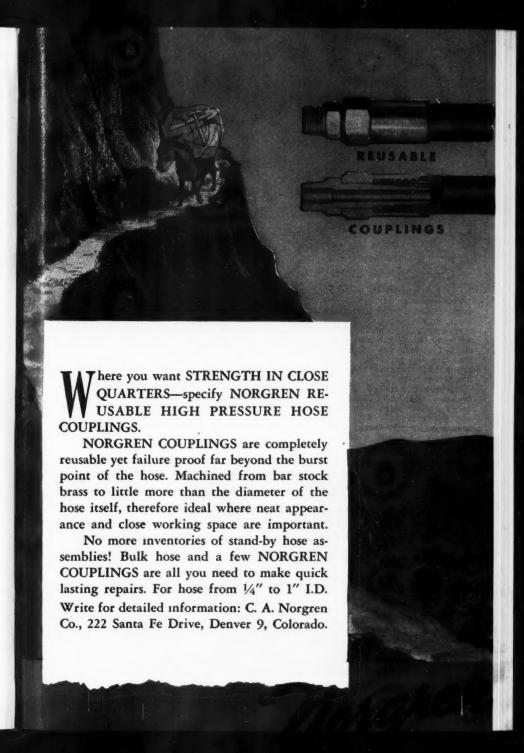
Order from your Disston Distributor, or write direct for booklet, "Disston Hand and Machine Hack Saw Blades." Each supplied in all standard lengths, widths, thicknesses and teeth per inch... for all machines. Also in sizes for hand use.

Get better hack saw service at a saving: Use Disston Hack Saw Blades,

For other metal-cutting tools of extra quality, ask for DISSTON FILES...CIRCULAR SAWS... CARBOLOY-FITTED CIRCULAR SAWS... TOOL BITS.

HENRY DISSTON & SONS, INC., 1221 Tacony, Philadelphia 35, Pa., U.S.A.

Canadian Factory: 2-20 Fraser Ave., Toronto 1, Ont.



#### YOU CAN CUT COSTS THREE WAYS

## with **DISSTON**HACK SAW BLADES

M

You save in cutting time. You save in down time. You get more cutting from each blade. All add up to increased production . . . lower production costs.

#### DISSTON U.S.A.



DISSTON HIGH SPEED STEEL BLADES saw through metals ordinary blades cannot cut. Use them for stainless steel, chrome-nickel steels and similar alloys.



DISSTON DI-MOL BLADES withstand severe strains and abuse. Use them for cutting tool and machine steels, cast iron, tubing and general machine shop production.



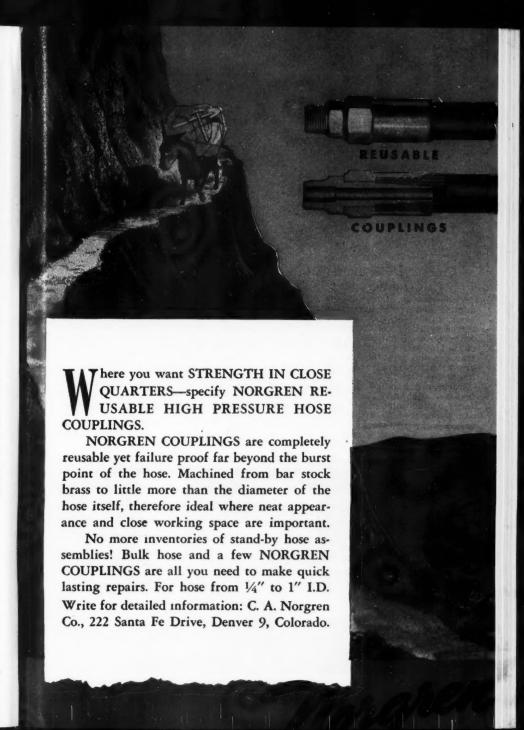
Order from your Disston Distributor, or write direct for booklet, "Disston Hand and Machine Hack Saw Blades." Each supplied in all standard lengths, widths, thicknesses and teeth per inch... for all machines. Also in sizes for hand use.

Get better hack saw service at a saving: Use Disston Hack Saw Blades.

For other metal-cutting tools of extra quality, ask for DISSTON FILES...CIRCULAR SAWS... CARBOLOY-FITTED CIRCULAR SAWS... TOOL BITS.

HENRY DISSTON & SONS, INC., 1221 Tacony, Philadelphia 35, Pa., U.S.A.

Canadian Factory: 2-20 Fraser Ave., Toronto 1, Ont.





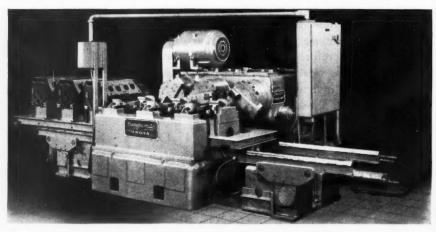
#### Cross Cylinder Block Facing Transfer-matic

The twin problems of adequate production and accuracy in facing cylinder block assemblies are said to have been solved by The Cross Co., Detroit 7, Mich., with the development of a special machine tool which is designed to finish the transmission joint face square with the crankshaft bore at the rate of 56 per hour.

Parts are handled in multiples by a transfer mechanism, and three blocks are faced at the same time. Only one operator is required. No lifting of parts is necessary since the blocks slide in and out of the machine on a conveyor with the help of an automatic power transfer

mechanism. Locating and clamping are also automatically effected. The use of single point carbide facing tools is said to assure accuracy, reduce heat at the cutting point, and eliminate unnecessary strains. Hydraulic valves are gaskets mounted and conveniently located for easy maintenance.

This Transfer-matic—Cross's name for its special machine tools equipped with automatic transfer mechanisms—can be expanded to include other operations. Machines can be added for precision-boring the locating holes of the transmission or finish-facing the crankshaft thru st faces. The transfer mechanism is then lengthened by incorporating standard units to accommodate the change.



Cross Cylinder Block Facing Transfer-Matic



#### INSPECTOR'S DIAL BENCH GAGE NO. 654

Among the many outstanding applications of Starrett Dial Indicators to quality control procedures, Starrett No. 654 Dial Bench Gage offers many advantages. The adjustable table and lateral and fine perpendicular adjustment of the sliding head provides the flexibility needed for rapid adaptability to a wide range of applications.

Any style of indicator can be furnished. When equipped with Starrett Indicator No. 25-T5 (0-5-0, reading .0001") fitted with tell-tale hand and top lift lever, the maximum in speed, accuracy and convenience is provided for taking close measurements on a series of work pieces. Starrett No. 25-T1 is another popular indicator widely used for this application.

For a complete description of Starrett Dial Bench Gage No. 654 and the many Starrett Dial Indicators for quality control, see Starrett Dial Indicator Catalog MD. Write for a copy.

#### Starrett No. 25-T-1 Dial Indicator

Reads 0-5-0 by tenthousandths, range .025. Can be furnished with tolerance hands to show plus and minus limits.



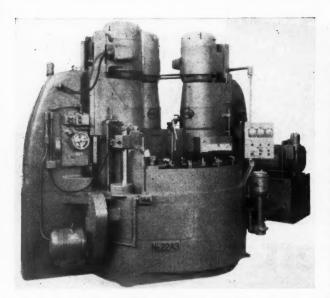
#### Starrett No. 23-TS Dial Indicator

A long range indicator reading 0.50, graduated .001", range .200", with double dial and tell-tale hand.

Starrett

MECHANICS HAND MEASURING TOOLS AND PRECISION INSTRUMENTS - DIAL INDICATORS - STEEL TAPES - HACKSAWS AND BAND SAWS - PRECISION GROUND FLAT STOCK Buy Through Your Distributor

THE L. S. STARRETT CO. · World's Greatest Toolmakers · ATHOL, MASSACHUSETTS, U.S.A.



#### Blanchard No. 22-A3 Automatic Surface Grinder

An automatic surface grinder designated as the No. 22-A3 has been brought out by The Blanchard Machine Co., Cambridge, Mass. The grinder has three wheels 22 x 14 x 16 inches and a work table of 68-inch o.d. and 40-inch i.d. The work to be ground may be of any size that will lie between the inner and outer edges of the table. The standard height for work is 12 inches, however, greater heights can be provided for by extending the columns.

The three heads and columns, with feed mechanisms and size control calipers, are identical. The machine may be Blanchard No. 22-A3
Automatic Surface
Grinder

operated with two wheels roughing and one finishing or with one wheel roughing and two finishing. If a relatively rough finish is satisfactory, all three wheels can be made to take heavy cuts.

Each wheel is followed by a wheel control caliper which maintains the wheel face at a fixed height above the work table. The continuously rotating table carries the work in succession under the roughing and finishing wheels, each wheel reducing the work height to that determined by the setting of the cal-

iper for that wheel. Final size is said to be held within  $\pm 0.0005$  inch.

The coolant system provides for the continuous removal of chips and sludge from the coolant and their deposition in sludge tank which can be readily removed for emptying. A motor-driven centrifugal pump of 150 g.p.m. capacity provides water to the wheels and to nozzles for washing the work and fixtures. A second similar pump supplies agitator nozzles in the base and delivers coolant from the base to a Barnes magnetic separator which is mounted over a separate outside tank. This tank and the the base tank are connected by a large straight pipe.

Built into each wheel head is a solenoid



HEAT TREAT

SMALL PARTS, TOULS & DIES

In Your Own Plant

 Install anywhere by simple wire connection. Quiet in operation. No fumes or odorsno ventilating required.

d h

g a h 11

e

1-

h

el nt

e.

0-

28 n

g

8,

g to

y

0 le çe

n

)s. r ıt )te ie

- Any intelligent man can operate furnace with automatic temperature control, using established procedures.
- Operating cost under 4¢ per hour to hold 1600° F. in Model 3 furnaces, with 2¢ per kw.-hr. rate. Others in proportion.

NOW YOU CAN heat treat, harden and temper small parts in your own plant . . . without ex-perienced heat treaters. Economical to install and use, Cooley Electric Furnaces operate efficiently at high or low heats, and save your large furnace time for work requiring large volume capacity. Here are some profitable uses:

PRODUCTION HEAT TREATING of small parts ... Small batches ... Running pllot lots to pre-determine mass production techniques ... Emer-gency repairs ... Industrial and laboratory testing ... Miscellaneous controlled heating jobs.



CHAMBER	8"W 6"H 14"L	10"W 6"H 18"L	8"W 6"H 14"L
MAX. TEMP.	18500 F.	18500 F.	20000 F.
AMPERES	14.8 at 230 v.	19.6 at 230 v.	20.2 at 230 v.
WATTS	3400	4500	4650
MODEL*	MH-3   VH-3   MK-3   VK-3	MH-4   VH-4   MK-4   VK-4	VK-5   VK-6
PRICE	200.00 230.00 250.00 280.00	295.00 325.00 345.00 375.00	420.00 340.00

- \* M models complete with hinged door and hearth plate.
- V models have counterweighted vertical lift door.
- K models include Selective Power Modifier for input control to correct temperature lag.

ACCESSORY EQUIPMENT
Electronic operated Veri-tron indicating and controlling ....\$143.00 pyrometer, with thermocouple and lead wire ..... Same in self-contained, enclosed panel including line switch and fuses, with steel stand—completely wired....... Steel stand with shelf..... .. 273.00 50.00

#### DEALERS AND DISTRIBUTORS WANTED!

Good territories open on this extensive line of self-contained small electric furnaces. Investigate now.

FORCED CIRCULATION AIR DRAW FURNACES — Write for data.

#### FREE LITERATURE

NEW CATALOG completely describes all models and applications for each. Write today for your copy



#### COOLEY ELECTRIC MANUFACTURING CORP.

34 South Shelby Street

Indianapolis 7, Indiana

INDIANAPOLIS MACHINERY EXPORT CORP

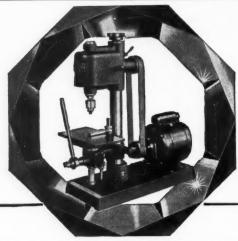
Export Manager, 44 Whitehall Street, New York, New York

operated dresser. On the control panel at the operator's position is an ammeter for each wheel motor and directly below each ammeter a button for operating the wheel dresser. Momentary pressure on the button causes the dresser cutters to be briefly forced against the wheel face, breaking loose the dull grains but not removing enough from the wheel to require any readjustment to maintain size. The dressers automatically follow up the wheels as they wear and are always in position to dress the wheels whenever the buttons are pressed. For convenience in renewing dressed cutters, the cutters and pin on which they revolve are contained in a removable holder, secured by one wing nut to the dresser.

Each wheel head has a short heavy spindle mounted in preloaded ball bearings and coupled to a 30 h.p. totally enclosed fan-cooled induction motor. Larger motors can be supplied if required. A 3 h.p. motor drives the rotary table, and other smaller motors provide power for the rapid raising and lowering of the wheel heads, feed, coolant pump, and separator. Control apparatus for all thirteen motors is housed in one cabinet which stands on the floor near the machine. The control current is 110 volts,

and a separate transformer provides 110-volt curent for operating the wheel dressers.

At the operator's position on the machine is a control panel containing the ammeters and wheel dresser push buttons previously mentioned, as well as signal lights to indicate the operation of the calipers and buttons for starting and stopping the other motors. An emergency stop button which stops all motors except the No. 2 pump and separator motors is provided on this panel, and a similar stop button is mounted on the base of the machine at the left of the operating position. Jog buttons for moving the rotary table are provided at several points to facilitate setting up. The table stop button on the operator's control panel can be locked in the "stop" position. When so locked, the table cannot



#### PRECISION INSTRUMENT TAPPER

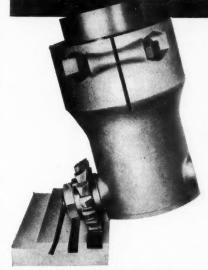
THE HAMILTON SUPER-SENSITIVE TAPPING MACHINE

Designed to meet the most exacting requirements of precision manufacturers. Patented power transmission permits centering of tap without cutting, and tapping to the very bottom of blind holes without tap breakage. Capacity from the smallest and finest tap to 10-32 inclusive. Silent and clean in operation. Our Bulletin T-47 gives full specifications. Write for it today!



**DOUBLE YOUR** MILLING CAPACITY WITH THE ...

Milmarker



#### CONVERT ONE MACHINE INTO A TOOL SHOP

Angle Milling \* End Milling Horizontal Milling ★ Reaming Sawing ★ Drilling ★ Boring Slitting \* Cutting Racks, Hobs and Broaches.

#### **BEMIS & CALL**

COMPANY

SPRINGFIELD, MASS.

WRITE TODAY FOR THE DETAILED FOLDER

dhe vy

arng-

ed. le. ver

he nd irnet na-

lts, te 0 uring ers. r's narol ing

ind ısh

sly vell to

raers

for op-

noen-

o n no-No.

paro-

anilar is

the

naof osions

ro-

ro-

eral ate

ta-

on

on-

be

he on.

red. not

948

BEMIS & CALL COMPANY, 310 Main Street, Springfield, Mass.

Send me free folder giving detailed information about the Milmaster "that converts one machine into a tool shop."

COMPANY\_\_\_\_\_

YOUR NAME.\_\_\_\_\_

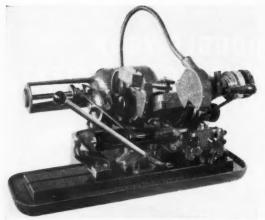
ADDRESS\_\_\_\_\_\_

CITY\_\_\_\_\_STATE\_\_\_\_

December, 1948

MODERN MACHINE SHOP

221



Hauser Pivot Polishing Machine with Lubricating Pump

#### Hauser Pivot Polishing Machine

A pivot polishing machine designed to meet the most exacting requirements of the instrument, meter, clock, and watch trades is now being offered by the Hauser Machine Tool Corp., 14 N. Bournedale Rd., Manhasset, N. Y. The machine is intended for the accurate and fast polishing of pivot bearing surfaces after they have been turned or ground close to size. A tungsten carbide polishing wheel is used.

According to the manufacturer, the Hauser pivot Polshing machine is designed to polish hardened steel parts, providing a mirror-like finish, and to also

impart an excellent finish to soft steel and brass parts. Shoulders and diameters are polished in one operation. Tapers, angles, and radii can be polished with equal ease, it is stated. The time required for pol-

be moved by pressing any button. The buttons controlling the rapid raising and lowering of the wheel heads are mounted on each column adjacent to the feed

gearbox. The complete machine without fixtures or coolant weighs approximately 41,000 lb.

The coolant capacity is 475 gallons.

#### IN SPEEDING

#### **Production Assemblies**

Years have proved the indispensability of these husky, sensitive hopper-fed machines in keeping pace with modern production.

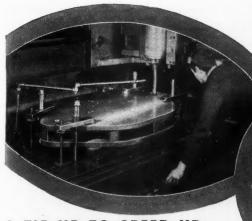
3 Models to drive screws from No. 2 to \( \frac{5}{2} \). Model B pictured drives screws from No. 6 to No. 1/4. No marring of screw heads or stripping threads. All screws driven to uniform tension.

SEND SAMPLE ASSEMBLIES FOR PRODUCTION ESTIMATE.





2807 West Detroit 16,



A TIE UP TO SPEED UP
"Near Neighbor" Service

## **PRODUCTO**

Special DIE SETS

The three links that tie together the factors you need to obtain Special Die Sets are Plant, Product and Service.

So let's look at the Producto record.

From foundry to finish your "Special" moves smoothly thru a cycle, every step of which employs expert manpower working with the finest of modern machines . . . many of

them Producto-designed.

The product itself is the highest development of precise skills . . . both in design and finish . . . proven for many years under critical and demanding conditions.

But the Plus feature . . . Producto "Near Neighbor Service" is unexcelled in its field. It is your assurance of correct interpretation of your needs and fast delivery.

We prove these facts when you "specify Producto."

#### "Near Neighbor" SERVICE

ATLANTA Main 4451 BALTIMORE Plaza 0340 BIRMINGHAM 54-9521 **BUFFALO** Cleveland 1110 CAMBEN, N. J. 4-7765 CHICAGO Central 6680 CLEVELAND Superior 6159 **DAYTON** Madison 5361 DETROIT Walnut 1-3101 ELMIRA 5168 IRIE 5-4375 GREENSBORD, H. C. 2-0608 INDIANAPOLIS Franklin 3508 LOS ANGELES Trinity 9826 MIAMI 3-2384 MONTREAL MA 5346 NEW YORK Worth 4-7484 PHILADELPHIA Lombard 3-4482 PITTSBURGH Atlantic 4116 ROCHESTER Main 5249 ST. LOUIS Jafferson 4805 SAN FRANCISCO Exbrook 2-2230 SYRACUSE 3-1181 TORONTO Hudson 9071 YORK, PA. 2042

#### THE PRODUCTO MACHINE COMPANY

940 HOUSATONIC AVE. BRIDGEPORT 1, CONN. TEL. 4-9481



13PD48

reet, nigan

1948

dectrutch by rp., asinand ing een ize.

ure is rts,

also and are

les.

ase, pol-

December, 1948

MODERN MACHINE SHOP

223

ishing is said to vary between 3 and 45 seconds, according to the diameter of the work and the size of reduction required.

The machine is built up on a base plate, at the front of which is a longitudinal bed having a machined surface and T-slot for accommodating the workhead and work support. Each head has a cast base, and passing through the center is a vertical spindle which supports the work spindle. At the bottom of the vertical pillar is a micrometer disc for accurately adjusting the center height of the work in relation to the support disc. The work

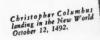
support is situated at the right-hand end of the bed and has a similar vertical adjustment to that of the workhead. In this case, however, the micrometer adjustment controls a stop for the polishing wheel and thereby the diameter of the piece. The spindle of this head contains a rotatable tungsten carbide disc which is positioned so that the pivot to be polished rests in a groove immediately beneath the polishing wheel.

The work spindle operates at a speed of 1,750 r.p.m. When the work is held in a collet, the spindle is driven direct. The

polishing wheel or lap (which operates at 620 r.p.m.) and quill form a unit which can be easily removed from the machine for regrinding, and so on. The quill is held in a swinging frame which is pivoted in a bearing mounted at the rear of the machine. The frame can be set for angle and displaced longitudinally. For polishing, the wheel frame is swung down to bring the wheel in contact with the work, the amount of pressure exerted and the duration of the operation depending upon the work.

Available with a lubrication p u m p and automatic release feature if desired, the Hauser Pivot Polishing Machine is offered in three types for polishing work diameters from 0.002 to 0.197 inch. The maximum length that can be polished ranges from 0.315 inch on a 2inch long workpiece to 1.197 inches on a 5-inch long workpiece.







## s worth discovering too

Columbus' discovery proved to be one of the most valuable discoveries in history ... and Bayflex Raised Hub Disc W beels have proved to be a remarkable "find" too, by foundries, welding shops, metal fabricating shops, automobile and truck body repair shops, for removing unwanted metal faster—easier cleaner. Operators are pleasingly surprised with production possibilities and their increased piece-work earnings.

Bayflex discs 1/8" and thicker are made of multi-layers of cotton fiber loaded with sharp abrasive grit — flexible yet extremely strong — can be used for edge as well as surface cutting giving "40 to 1" life, and more, over conventional discs.

Words cannot fully describe this new wheel, you must see it in operation. Send coupon today for a demonstration.

BAY STATE ABRASIVE PRODUCTS CO. WESTBORO, MASSACHUSETTS, U.S.A. Branch Offices and Warehouses Chicago - Detroit

Distributors - All Principal Cities









Bay State Abrasive Products Co. Westboro, Mass.

Please have your representative call just as soon as possible to demonstrate Bayflex Raised Hub Disc Wheels. It is understood that this will not obligate us in any way.

City......State......

Individual.....

t e

e

e

r g

2

e

h 1n

#### Solved! Your Engraving Problem



MODEL CC 3D

A versatile machine for contour milling, profiling and engraving. Covering far larger areas and selling at a lower price than any machine now available.



#### Variable Ratio Pantogrph

Engraves an area 5 by 5 inches on curved surfaces without special templates, with smooth lines in any design, number, letter; on iron, brass, copper, aluminum, soft steels and all plastics. • Drills a series of holes • Profiles small parts • Increases accuracy and production • Works from original drawing or templates • Etches glass and similar items • Will not cause distortion. For information and prices write Dept. M.

Consuit your distributor or

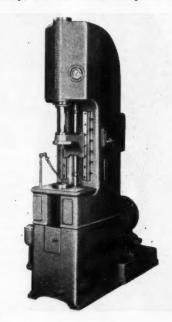
AUTO ENGRAVER CO., Inc.

#### Greenerd G6-S-W-C Broaching and Guided Assembly Press

Designated as the G6-S-W-C, a selfcontained machine especially designed to provide an extremely rugged and rigid press with a minimum of deflection for broaching and assembly requiring accurate alignment is announced by the Greenerd Arbor Press Co., Nashua, Vt. Intended for wet or dry broaching, assembly, and die work, the press has a

No op ces up du ca an its for we

or



Greenerd G6-S-W-C Broaching and Guided Assembly Press

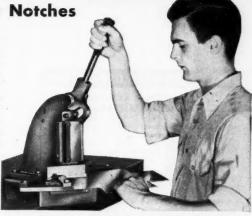
2%-inch diameter high alloy steel heat-treated and ground ram which is guided on heat-treated and ground ways to keep the ram accurately in line the full length of travel. The cylinder is honed to size and fitted with cast iron piston rings, and the ram is sealed with chevron type asbestos and Neoprene packings. The speed of the ram down is adjustable from 20 inches per minute to 300 inches per minute, with a return speed up at the rate of 460 inches per minute.

Equipped with coolant for wet broaching, the machine is not only said to be suitable for broaching but for assembly

## THE di-acro NOTCHER

Duplicates Precision Notches WITHOUT DIES!

The new precision DI-ACRO Notcher is so fast and easy to operate that it is no longer necessary to invest in dies and set up a punch press for many production notching operations. It can be so quickly adjusted for any size or shape notch within its capacity that it is also ideal for experimental or research work. Many straight shearing operations are also possible with this unit.



#### CUTS CLEAN-NO BURRS OR ROUGH EDGES

The powerful action of the DI-ACRO Notcher results from an exclusive DI-ACRO designed roller bearing cam which provides a tremendous pressure with a small amount of effort. The precision-ground Veeshaped ram and blades of alloy tool steel assure clean cuts and permanent accuracy in production runs of duplicated notches.

LARGE CAPACITY. The DI-ACRO Notcher will cut 90 degree notches up to 6 by 6 inches in 16 gauge steel in one operation. Larger notches, and wider or narrower angles, can also be cut. A built-in flexible gauging device quickly locates a notch in the desired position and duplicates it exactingly.

SEND FOR 40-PAGE CATALOG—Get full information on all six "DIE-LESS DUPLICATING"

six "DIE-LESS DUPLICATING" production boosters—DI-ACRO Benders, Brakes, Shears, Rod Parters, Punches, Notchers—and their many applications for experimental work and speedy production of duplicated parts.

DI-ACRO is pronounced "DIE-ACK-RO"



D'NEIL-IRWIN MFG. CO.

306 EIGHTH AVENUE, LAKE CITY, MINNESOTA

or die work that requires accurate alignment and a minimum of deflection. As an extra for assembly or die work, the press may be furnished with dual ram control as a safety measure. The G6-S-W-C has a maximum pressure of 6 tons and is driven with a 10 h.p. motor, interconnected by three V belts with a hydraulic pump. The pressure may be adjusted from % to 6 tons. The machine is designed to accommodate work up to 12 inches in diameter; has a maximum daylight opening of 21 inches and minimum daylight opening of 3 inches; a ram travel which is adjustable from 1 to 18 inches.

controlled by power stops; and a work table 17 inches wide x 10 inches deep, with 31/2-inch cored hole central with ram and with oil gutters. The machine is also made in 4 and 8-ton models.

#### Airco No. 394 Welding Electrode

Designated as the Airco No. 394, a lowhydrogen type coated electrode designed to prevent underbead cracking in weld deposits has been announced by the Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y. According to the manufacturer, the electrode can be operated on either a.c. or d.c. and is designed to produce welds of 100,000 p.s.i. It is particularly recommended for use in the fabrication of hardenable steels which are susceptible to underbead cracking.

#### Rogers Type NT-160 Knife Grinder

Identified as the Type NT-160, a knife grinder with extra heavy duty construction throughout for the precision grinding of knives up to 160 inches long is now being produced by Samuel C. Rogers & Co., 183-205 Dutton Ave., Buffalo 11, N. Y. Designed for the easy, accurate grinding of knives and blades used in various trades and industries, the machine can also be adapted for squaring shear blades and other face grinding operations. It is constructed to grind grind flat or concave, wet or dry.

An outstanding feature of the Rogers Type NT-160 Knife Grinder is the extra wide 5-inch V-way on the base and carriage to permit unusually heavy grinding pressure and fast feed required for production and precision grinding. transmission is of a simple clutch-type design with reversing gears. The cross feed can be controlled either manually or automatically. A convenient handwheel with graduated indicator and dial



#### DUAL CROSS and ROTARY FEED Rotary, Index MILLING TABLE

No. 83 Only \$49.50 Has 8" table, 360° move-ment and 4" cross feed travel. Adjusting wheels and dials graduated in degrees and thousandths. Slotted for bolting to table. No. 82 without rotary feed \$39.75.

Write for Circular No. 10.

CHICAGO TOOL and ENGINEERING CO. 8399 South Chicago Ave. Chicago 17, Ill.





ep, am lso

de wned eld Air ew nuon rocuorius-

ife ucing beco., Deof des be

ve,

ers
tra
aring
roThe
ype
oss
illy
ndlial

T ED

NG ING ING

teed FOR OG

948

Garwood, New Jersey. Stock of all popular Complete factory stocks maintained at lypes and sizes maintained at Cleveland, DRILL JIG BUSHINGS Dayton and Stratford. Made from the finest steel obtainable for the purpose. Each bushing carefully heat treated 62 to 64 Rockwell C hardness. All bushings inspected for accuracy of size, as

# REPRESENTATIVES

well as for concentricity.

HOUSTON, TEXAS Chickering Tool & Eqp't. Co. W-6-8584

> CLEVELAND, OHIO Die Supply Company UT 3-0850 DAVENPORT; 10WA emport Engineering

> > New catalog gives standard bushing sizes. Sent, with price list and other information indispensable to the tool engineer, upon request.

The Standard Die Supely, Inc.
Ritor 6319
MILWAVINE 3, WIG.
The Stone Company 1862
MINNEAPOLIS 3, MINK
George Species Company 1862

George Species Company 1862

MINNEAPOLIS 3, MINK

George See Co.

MRW YORK, N. V.
Carlon Ebehard
Wisconsin 7-2453
PHILADELPHIA, PA.
Albert R. Bern
BERWATH E-2553
ROCHESTER, N. V.
Fint Tea Go.

STRATFORB, CONN. sworth Steel & Supply Gs. BRidgeport 7-3317

ACCURATE BUSHING COMPANY

437 North Avenue, Garwood, N. J.

Westfield 2-2415



December, 1948

MODERN MACHINE SHOP

229



Rogers Type NT-160 Knife Grinder

permits the machine to be quickly set up for grinding the exact angle desired. A two-motor drive is utilized—a 10 h.p. motor for the carriage drive. The grinding head is mounted on a massive back base and can be fed automatically or by hand. The Rogers Type NT-160 Knife Grinder also features an automatic force feed oiling system for the carriage bed and vertical drive shaft bearings. A built-in unit for wet grinding is standard equipment. The machine weighs approximately 8,500 lb. Grinders of similar design are available down to 48-inch capacity.



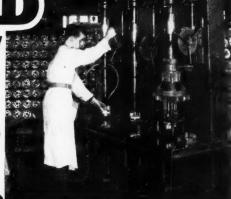
Gosh, Yes!

A SSOCIATED AIRCRAFT TOOL & MFG. CO., Hamilton, O., found that U. S. Drill Head's standard adjustable multiple spindle drill heads stood the gaff—and are still going strong after drilling 600.000 holes.

#### IMMEDIATE DELIVERY!

• Write Today

for latest catalog.





SINCE 1915

Also manufacturers of all types of fixed center heads

UNITED STATES DRILL HEAD CO

CINCINNATI 4, OHIO

Charge to the account of the account

Yes, when an unusual holding problem will not permit the use of a standard chuck, Walker Engineers design the right magnetic holding device, to meet the requirements of the particular problem.

Hold Everything! Chucks Walker Walker

O. S. WALKER CO.Inc.

WORCESTER 6, MASSACHUSETTS

Original Designers and Builders of Magnetic Chucks

ads

Onsrud A-18 Rotary Table Contour Milling Machine

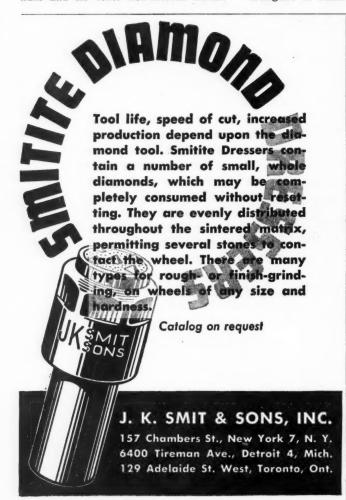
The mass production of round, rectangular, or irregularly contoured parts up to 18 inches in overall diameter is said to be a continuous operation with no interruption for work setup on the Onsrud A-18 Rotary Table Contour Milling Machine illustrated herewith, product of the Onsrud Machine Works, Inc., 3900 Palmer St., Chicago 47, Ill. The unit is designed for the machining of aluminum and all other non-ferrous metals

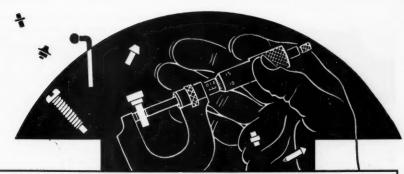
with similar cutting characteristics.

Key to the machine's uninterrupted production cycle is the dual-table construction which permits one of the tables to be loaded by the operator while work is being milled on the other table. As each milling operation is completed, the operator presses a pedal which automatically disengages the driving clutch for the rotating table, engages the clutch for the waiting table, and shifts the cutting tool to the new work, thus starting a new cycle.

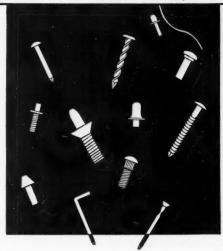
Designed to enable such typical pro-

duction parts as cast aluminum waffle irons and handiron faceplates to be machined at a high speed rate, the Onsrud A-18 Contour Miller may be readily operated by unskilled labor due to the fact that the milling operation is completely automatic and is accurate to close tolerances. In operation, the work is rotated on the machine tables past the cutter head assembly, which consists of a high speed belt driven spindle, cutter, and guide roller mounted on the front end of a rugged overarm that pivots toward the right or left-hand table as required. The roller contacts the pattern under the work and guides the cutter, the roller being held to the pattern by pneumatic pressure. The work is held in place on the tables by means of air clamps under 700 lb. pressure (assuming a line pressure of 100 p.s.i.). The clamps are designed to synchronize with the





special nails • rivets • screws • made to your order



HASSALL Cold-heading may solve your immediate special part problem . . . Special nails, rivets and threaded parts made in diameters from 1/32" to 3/8"—lengths up to 7"... Rivets 3/32" diameter and smaller a specialty . . . Variety of metals, finishes and secondary operations . . . Economy, quality and quick delivery in large or small quantities . . . Tell us what you need . . . We will answer promptly. ASK FOR FREE CATALOG. 3-color Decimal Equivalents Wall Chart free on request.

JOHN HASSALL, INC. • 394 OAKLAND STREET, BROOKLYN 22, N. Y.



SPECIAL NAILS RIVETS SCRE

d ed . s -d . s n y r o



COMPACT Power ... for immediate delivery!

his small, sturdy, fractional H.P. motor (Type C) is now available for immediate delivery and can be readily adapted to a wide range of industrial uses. Measuring only 7" high, it is ideal for jobs where space is limited.

Excellent for continuous, general purpose duty on pumps, fans and hoists. It's tops in versatility – high torque, rated 1/4 to 1 H.P. in 12 different ratings, 50 & 60 cycle. Sealed ball bearings require but infrequent lubrication and dustproof housing assures long life even under rigorous operating conditions. Furnished in 2 or 3 phase only. Small, powerful, compact, this high quality Cleveland Electric Motor will give you many hours of dependable service.

You'll be interested in our prices and ability
to deliver fast. Write now for complete information
on our entire line of general and
special purpose motors.



CLEVELAND ELECTRIC MOTOR CO. 5219 CHESTER AVE. CLEVELAND 3. OHIO

right or left travel of the overarm. The roller is so arranged that it can be adjusted in relation to the cutter to compensate for wear. A snubber absorbs the shock when the roller contacts the pattern.

To provide for high quality work finishes, the cutter spindle of the machine is operated at a speed of 11,500 r.p.m., this speed being made possible by patented centrifugal force feed lubrication



Onsrud A-18 Rotary Table Contour Milling Machine

of the spindle bearings and a vacuum pulley belt drive. Table rotation speeds are variable over a wide range; adjustments may be made while the machine is in operation. The work and operator are safeguarded by an air line pressure switch which is arranged to stop the machine motors should the air pressure for the work clamps or tool arm drop below 60 p.s.i. The lever controlling table speed is protected by a safety lock to guard against accidental bumping.

#### **Kux Die Casting Machine**

Available in three different models, a die casting machine having an 800-ton locking pressure has been introduced by



#### meet the "steady grind" of this foundry

This is the *Torit* No. 122 Dust Collector. It handles a large volume of abrasive dusts efficiently. There is a minimum of piping, and the cleaned air is recirculated, reducing heat losses. It runs only when the grinders

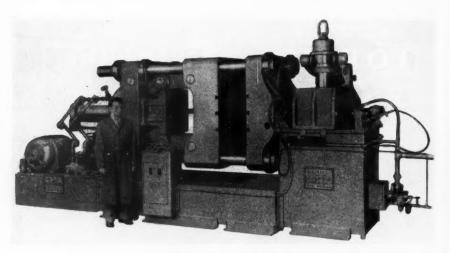
are operating, and is easy to keep clean.

Compact, self-contained *Torit* Dust Collectors will solve your dust problem. Moderately priced, they fit easily into present and future production layouts. Standard models, up to 5 H.P. are available for immediate delivery. For details and the latest Torit catalog, write:

#### TORIT MANUFACTURING CO.

296 Walnut Street

St. Paul 2, Minn.



Kux Die Casting Machine

the Kux Machine Co., 2940 W. Harrison St., Chicago, Ill. The machine is said to form castings in zinc weighing up to 30 lb., and in aluminum weighing up to 10

lb. Extremely high injection pressures are utilized, reaching as much as 40,000 pounds per square inch.

The machine has a die space of 40 x 25

## DIE CUT PARTS



FINE WORKMANSHIP PROMPT QUOTATIONS DEPENDABLE DELIVERY

#### FOR EXPERIMENTAL

**Using Quick-Process Temporary Dies** 

#### FOR PRODUCTION

**Using Semi-Permanent Process** 

**OUR SPECIALTY:** Stamping, Forming, Piercing, Extruding, Stenciling or Tapping small irregular shaped Parts (80-Ton Blanking Cap).

BIG VALUE @ SMALL COST!



3296 E. 80th ST. . CLEVELAND 4, OHIO

Economically Priced to Save You Costs in Production and Maintenance Work But . . . Precision Designed, Engineered and Built to High Quality

AMERICA'S GREATEST

AND MOST COMPLETE LINE

GIVES YOU EVERYTHING

IN SUPERBLY BUILT

ELECTRICAL TOOLS

One of America's most popular grinders is Model 500

UTILITY FLOOR GRINDER

## IN STOCK AT YOUR JOBBERS

Drills
Buffers
Files
Grinders
Heat Guns
Hole Saws
Nut Setters
Polishers
Reamer Drives
Surfacers
Tappers
Valve Seat Grinders
Valve Refinishing Shops
Flexible Shaft Machines



#### WHEEL GUARDS ADJUSTABLE TO WHEEL WEAR

Totally enclosed motor; push button starter



for overload protection; ball-bearings enclosed in dust-tight housings; enclosed adjustable wheel guards and many other quality features.

The UNITED STATES ELECTRICAL TOOL Co.

000

25

ies

cing,

ular

ST!

IG IY

HIO

948

inches between the tie bars and 171/2 inches of die separation, thus enabling very large dies to be accommodated and castings having a deep draw to be easily produced. The unit is completely hydraulically operated and electrically controlled, with the movement of electric push buttons being the only operation required for a complete die casting cycle. The speed of operation is practically the same as on smaller machines, with an average of three to four zinc casting cvcles or two aluminum casting cycles per minute being possible.

A gooseneck plunger type machine, the

Model BH-40 is designed to produce zinc, lead, or tin die castings, and has a selfcontained melting pot and furnace in-corporated within the frame of the machine. For the production of aluminum, magnesium, or brass castings, the Model HP-40 is available which has a cold chamber hand ladling injection unit.

Constructed as a convertible machine, the Model BH-40C utilizes a gooseneck plunger mechanism for zinc castings and a cold chamber hand ladling unit for aluminum, with conversion from one style of die casting to the other requiring a minimum of change-over time. Mas-

sively constructed throughout, this model has cast steel die plates and toggle links, with heat-treated alloy steel used for the 6-inch tie bars, toggle pins, and other pressure members. The two-way double-locking toggle is said to safely withstand its rated 800 tons holding pressure, thus keeping casting flash at a mini-

Automatic casting ejection is provided for by the Kux Die Casting Machine, the ejector pins being automatically returned, as well, before the die plates close to prevent interference with side core pins. Complete stroke control of die opening and closing is afforded by the electrical circuit so that the die plates can be opened or closed the amount desired or stopped in any position of the 171/2-inch total separation stroke.

The Kux injection pressure multiplier is also part of each model. This



Here's a grinder designed especially to grind or lap carbide tools with greater speed and economy. It's equipped with a special 1 HP motor for unlimited frequency of spindle reversing, 12 gal./hr. coolant pump, a table that sets at any angle from 5° above to 15° below horizontal, full circumference swivel wheel guard for right- or left-hand grinding . . . plus many other superior features.

Supplied with a practically indestructible Wickman Steel-Bonded Diamond Wheel that won't waste diamonds ... that will finish tools much better for longer tool life and 300% more service between regrinds.

For efficient carbide grinding, it's the Wickman-Neven Bench Grinder and Wickman Steel-Bonded Diamond Wheels. Also, Resinoid-Bonded Diamond Wheels and Steel-Bonded Chip-Breaker Diamond Wheels.

Free On Request Write today for free literature on any of the Wickman carbide grinding products.



CIC

CO

#### SOUTH BEND 10" Precision Lathes

ic, lf-

n-

a-

m.

lel

old

ne.

ck

nd

for

ne

ng

as-

ed

is

ast

nd

ith loy the ogner rs. ougle ely ted ing nus ng nistrothe ing ecaurebetes in-

ith ins. ke en-; is the t so ates

or unt

ped of otal

ce.

jec-

nul-

part

**This** 

1948

The 10" Swing, 1-inch Collet Capacity South Bend Precision Lathe is engineered for the most exacting close-tolerance machine work. The direct belt drive to the carefully balanced spindle assembly provides smooth, vibration-free speeds up to 1357 r.p.m. Slow speeds for heavy cuts on large diameters are driven through back-gears. Full quick change gear equipment makes any of 48 different threads and 48 different feeds instantly available.

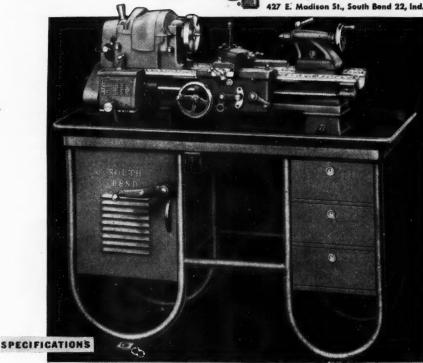
The precision, speed, and versatility of this lathe assures an efficient output on toolroom or man-

ufacturing jobs. The 1-3/8" bore through the headstock spindle makes it especially suited for machining parts from bar or tube stock. A complete line of practical attachments greatly simplifies tooling the lathe for a wide variety of operations. Write for information on South Bend 10" Lathes and the NEW 14" Drill Presses. Immediate delivery. Time Payment Plan.



#### SOUTH BEND LATHE WORKS

**Building Better Tools Since 1906** 427 E. Madison St., South Bond 22, Ind.



Catalog No. 187-YS South Bend 10"-1" Collet capacity Quick Change Gear Bench Lathe Illustrated, Price — f. o. b. factory with 3' bed; 3 \$99435 phase, 60 cycle, 220 Volt, A.C. motor; drum switch; and bench . . .

SWINGS: 101/2" over bed and saddle wings, 53/4" over saddle cross slide. BED LENGTHS . . . 3, 31/2, 4 and

41/2 feet COLLET CAPACITY . . . 1 inch CENTER DISTANCE . . . 14% to 321/4 inches

SPINDLE BORE . . . 1% inches 12 SPINDLE SPEEDS . . . 50 to 1357 r.p.m. CROSS SLIDE TRAVEL . . 5%"

POWER LONGITUDINAL FEEDS: 48 R.H. or L.H. . . . 0015" to .0836" 

THREAD CUTTING: 48 R. H. or L.H. pitches, 2 to 224 per inch



unit, by multiplying the ending pressure 2 to 1 over the starting pressure, provides for packing of the metal into the die, thus assuring solid, dense casting production.

Turco "Storm King" Steam Cleaner

#### Turco "Storm King" Steam Cleaner

Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif., announces a steam cleaning unit to be known as the "Storm King." Available for natural gas, manufactured gas, or oil heating, the unit may be procured for stationary, portable, or trailer use.

Designed for quick, efficient, and economical cleaning, the Storm King provides a choice of steam cleaning utilizing 180 gallons of water per hour, or high pressure rinsing utilizing 240 gallons of water per hour. A pressure of 150 lb. is maintained for either operation.

Designed for simplicity of operation and maintenance, the Storm King includes working parts that are easily accessible. Heating to operating pressure is

#### simpler way **ALIGNING** THE WORK WITH THE SPINDLE

On tapping and reaming jobs, instead of spending the extra time necessary to make an absolutely accurate alignment of the work with the spindle, why not try this simpler way!

In place of an ordinary tool holder, use a Ziegler Tool Holder. Then all you have to do is align the work with spindle to within 1/32" radius or 1/16" diameter, and the Ziegler Holder automatically compensates for the difference.

You'll find that the labor costs saved will reimburse you for the cost of the Ziegler Holder in a remarkably short time and then continue to save you money throughout the life of the holder. Try it and see.

and Reamers ...



Types to fit any machine used for tapping or reaming



#### W. M. ZIEGLER TOOL

G HOLDER 1928 TWELFTH ST. DETROIT 16, MICH.



WRITE FOR

## SPEED PRODUCTION!



oė .'' .s, oil oe r-

nes

er re ns

ed on

n-

C.

is

WITH ...



Reg. U. S. Pat. Off.

## KNURLED SOCKET SCREW PRODUCTS



Patd. and Pats. Pend.

"HALLOWELL"



KITS: Pats. Pend.
You can't tighten or loosen
socket screws without a
hex socket wrench, so why
not get our No. 25 or No.
50 "Hallowell" Hollow
Handle Key Kit which
contains most all hexsocket bits.

Millions of these "Unbrako" Socket Screw Products—in sizes from No. 4 to 1½" diameter, in a full range of lengths—are being used throughout industry to: save assembly time, facilitate compact designs, reduce weight and costs.

(A) The KNURLING—as shown—swages the threads of this patented "Unbrako" Socket Set Screw,—so that it becomes a most excellent Self-Locker . . . for use with—cone, flat, oval, half and full dog points, which cannot be knurled—a Set Screw that positively "will not shake loose"!

As all our patented "Unbrako" Set Screws, regardless of type of point, are Self-Locking, we can lock most any set screw application. We are prepared to furnish "Unbrako" Socket Screw Products in Stainless Steel.

(B) The head of the ubiquitous "Unbrako" Socket Head Cap Screw is KNURLED to speed assembly. The KNURLS "gear" right to the fingers, no matter how oily, and a positive slip-proof grip is the result—no waste motion. Of course, the Internal Wrenching feature provides cost savings in material, weight and space.

Write us for the name and address of your nearest "Unbrako" Industrial Distributor and for your copy of the "Unbrako" Catalog.

**OVER 45 YEARS IN BUSINESS** 

#### STANDARD PRESSED STEEL CO.

JENKINTOWN, PA., Box 556 • Branches: Chicago, Detroit, Indianapolis, St. Louis, San Francisco

said to be instantaneous and thermostatically maintained. A 64-gallon graduated solution tank is claimed to eliminate the need for shutdown to refill. Solution strength may be varied according to cleaning needs with a simple finger-tip control.

#### Metal & Thermit Corporation Arc Welders

The Metal & Thermit Corp., 120 Broadway, New York 5, N. Y., announces a group of a.c. and d.c. arc welding ma-

#### ARTUS PLASTIC SHIM



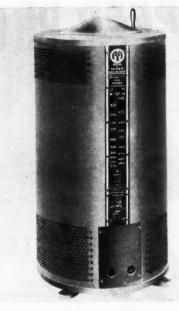
AND FEELER GAUGE STOCK

The COLOR tells the THICKNESS

Each thickness a distinctive, easy to identify color. Impervious to oil. Long lasting. 5"x20" sheets. Special sizes to order. Handy assortment, shim stock, 12 colors—12 thicknesses (.001-.050). Bound together. \$4.25.

Order today. Immediate delivery.

INDUSTRIAL PRODUCTS SUPPLIERS 434 Broadway, Dopt. M, New York 13, N.



M & T A.C. Arc Welder

chines. Features of the a.c. units include built-in power-factor corrector; fingertip, stepless current control; fan-forced ventilation; wide current range; and moderate open-circuit voltage operation. The units are of the transformer type, available in 150, 200, 300, 400, and 500-ampere capacities. They also provide for instant plug-in plug-out of electrode leads by use of taper-type connectors. Lead interchange is eliminated by a permanent work lead connection. Running gear is available where portability is required.

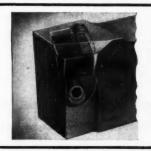
A major design feature of all d.c. mod-

#### INSERTED SOLID CARBIDE TOOLS WITH MECHANICAL LOCK

A modern tool holder designed especially for efficient, economical use of solid carbide inserted tool bits. Eliminates ground in chipbreakers and brazing strains. Provides quick change tool bits and low reconditioning costs. Shank dimensions from 3/4"x3/4"x41/2" to 11/2"x2"x7".

Choice territories are open for sales representation. Write for information. Write for folder.

IKING TOOL CO., SHELTON, CONN.



### Let MEAD'S STEEL-FINGERED GIANTS DO THAT JOB

Faster, Beller, Cheaper



Besides the standard, ready-made fixtures for the application of Air Power, (such as the Air Press, Air Vise, Air Chuck, Air Clamp) Mead offers a wide selection of air cylinders which can be used in special lias and fixtures. Illustrations show four types of double-acting cylinders which can be furnished in five different bores with optional length of stroke.

> Get faster, more economical production set-ups — investigate the entire "family" of Mead Air - Operated devices. Do you want to move things - lift them, slide them, tilt them - or hold them firmly? Mead Air Power will do it. Do you need a delicate flexible touch? Mead Air Power has both.

CATALOG READY

d

n.

e, or is direction

Send for copy of our new Air Power Catalog illustrating, describing many new man-andmoney-saving devices.

DEVICES save precious man-hours!







Use MEAD AIR POWER



els is a one-dial simplified control panel which includes a series of well-marked outlets, each one for an electrode of different diameter. The operator simply plugs into the proper outlet, and then dials for any required minor adjustment in current. Motor-driven d.c. units are available in 150, 200, 300, and 400-ampere capacities in compact 3,600 r.p.m. and

conventional 1,750 r. p. m. types. Engine-driven welders include 200-ampere units powered by air-cooled Wisconsin engines, and 300 and 400-ampere sets driven by Chrysler industrial engines.

#### DoAll 7-Inch Capacity Band Filing Machine

A 7-inch capacity band filing machine which can be operated by a person either seated or standing is announced by The DoAll Co.,

Des Plaines, Ill. The table height is 39 inches. The work table is 18 inches square and is lighted by an adjustable lamp.

The machine frame is of unit welded steel construction, completely enclosing all moving parts. Access to the interior is obtained by opening a single door, exposing both upper and lower wheels. Motor and drive compartments are isolated

## WHO

makes precision
"milled from the bar" screw machine
products that stand up under hard
usage...and build up sales through
customer demand?

### WIT Ottemiller YORK, PENNA.

... of course!

Write today for the new eye-catching folder that illustrates and describes our famous line of ...

CAP SCREWS • SET SCREWS •
COUPLING BOLTS • and MILLED STUDS
in all sizes and threads

#### PEERLESS

#### **Abrasive Belt Surfacer**

Speed and quality in grinding flat surfaces of metal, wood, hard rubber, celluloid and plastics. Obtainable in both vertical and horizontal types—9", 14", 20" sizes.

Send for illustrated pamphlet.



Production
MACHINE COMPANY GREENFIELD WASSACHUSETTS USE

## R-B INTERCHANGEABLE PUNCHES and DIES



radially. Quickly and easily installed and removed, press "down-time" for punch or die replacement can be held to a minimum. They save time and money in die building, too, because they are easily and accurately assembled in die construction. They are completely interchangeable; selected steels with controlled hardness and finished to very close tolerances insure uniformity.

R-B punches and dies of standard sizes, shapes and materials are carried in stock for immediate delivery. Those of special sizes, shapes and materials are made promptly to your specifications.

#### GET THE WHOLE STORY IN THIS FREE CATALOG

A 48 page book containing full information on Allied's "one stop service." Write for your copy.





m.
idits
isnd
by
s.

nd be er inio., 39 ire

ior

fo-

948

**ALLIED PRODUCTS CORPORATION** 

# MAKE TOUGH METAL CUTTING JOBS EASY INSIST ON STAR BLADES

Want to zip through the toughest metal cutting jobs in jig time? Of course, who doesn't?

Then be sure you're using a Star hack saw blade. They're designed and made to make cinches out of tough cuts. Only the finest steel is used — automatic machines shape teeth precisely — special heat treatment provides extra blade strength. As a result you get a faster, cleaner cutting blade that lasts longer.

A complete Star line is made for all types of metal and plastics cutting and for either hand or power equipment. Ask your dealer to show you Star.

#### AT YOUR DEALER'S NOW!

Your free copy of Star's booklet, "METAL CUTTING" and the new Star Wall Chart. Ask for these helpful guides to better selection, use and care of your hack saw equipment.



CLEMSON
CLEMSON BROS., INC.
MIDDLETOWN, N. Y.

Manufacturers of Hack Saw Blades and Frames, Metal Cutting Band Saw Blades and the Clemson Model E-17 Lawn Machine.

by a solid steel sheet that keeps chips and shavings out of the mechanism. A ½ h.p. motor drives an enclosed worm reduction gear governed by a Speedmaster variable pulley. Optimum cutting speed for any material is instantly available by turning a handwheel on the Speedmaster which controls surface travel of the file band between 50 and 250 feet per minute.



DoAll 7-Inch Capacity Band Filing Machine

The construction of the machine provides for an unimpeded work area all around the file band. A built-in air pump with chip blowing nozzle on the end of a flexible tube makes guide lines easy to follow. A velvet-smooth tilting mechanism permits accurate level, mitre, or angle cutting. When set with a protractor or a sine bar, the table is said to stay put as long as desired but can be quickly swung back to 90 degrees when the lock is released. The band length of the machine is 120 inches, providing a smooth running, continuous cutting file. Three band sizes are available, including widths of 1/4, %, and 1/2 inch in six types of cut and with flat, oval, or round shape.

# Convert to HIGH SPEED STEEL and SENTRY HARDENING

### Why?

of

n-

or

ly ek

ath Increased production and longer tool life result from converting to H. S. S. Tools. These tools give even better performance when full hardened the Sentry way. Sentry Electric Furnaces utilize the Sentry Diamond Block method of obtaining a controlled neutral atmosphere for long soaking without carburization, decarburization, scaling or shrinkage. Intricate form cutters are held true to shape. No grinding necessary after hardening.

### Here's Proof!

A Sentry Furnace user comes up with these interesting figures. The tests were made on cutters, drills and punches.

### Former Steel Used

400 Parts per Cutter 350 Holes per Drill

1200 Parts per Punch

#### H. S. Steel Sentry Hardened

2600 Parts per Cutter 3350 Holes per Drill 14300 Parts per Punch

Many other Sentry users have equally convincing production figures. Get the facts about Sentry Furnaces and Sentry Diamond Blocks

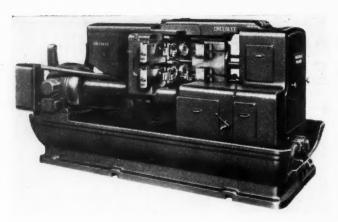
Sentry Furnaces pay for themselves in a short time through better quality hardening for longer lasting tools. Write for full information.

ASK FOR BULLETIN 1054-E12

The Sentry Company

FOXBORO. MASS., U.S.A.





Greenlee Revised 4-Spindle Automatic Screw Machine

rigidity of the spin-

dle-carrier housing, thus permitting the use of heavier tooling. The main toolslide has also been strengthened by the addition of gibbed ways fastened to the overarm. A new main clutch unit is said to ensure a positive feed for handling heavier cutting loads.

The four rugged parallel-mounted cross slides of the revised machine are actuated through a system of cams which are easily and quickly interchangeable. Other distinctive features of the machine include rapid adjustment of the main toolslide stroke through the use of a graduated worm-wheel; an easily accessible tooling area for quick setups and easy

### Greenlee Revised 4-Spindle Automatic Screw Machine

Greenlee Bros. & Co., Rockford, Ill., has made several revisions on its 2%-inch 4-spindle automatic screw machine. An overarm has been added which provides the machine a more streamlined appearance and, at the same time, increases the

# **Anderson**BALANCING WAYS

Shops handling rotating parts find this simple, sturdy and thoroughly dependable device highly efficient for balancing and truing operations. It assures better work . . . saves time . . . saves labor. No leveling required.

Four chilled iron discs rotate with minimum friction on sensitive special bearings, giving a quick, accurate indication of whether or not the work is in perfect balance.

Swing	Greatest Distance Between Standards	Capacity in lbs.		
20 in.	20 in.	1,000		
40 in.	30 in.	2,000		
60 in.	30 in.	2,000		
72 in.	66 in.	5,000		
96 in.	88 in.	10,000		





Write for Bulletin No. 12-22



ANDERSON BROS. MFG. CO., Rockford, III.

Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters, Hand and Power Hydraulic Straightening Presses.



DRILL THESE HOLES

BY A QUICK, EASY, INEXPENSIVE METHOD
Your business letterhead will bring literature.
WATTS BROS. TOOL WORKS
Wilmerding, Pa.

# CAMS

Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

Let us have your inquiries.
BLOOMFIELD TOOL CORP.

37 FARRAND ST.

4-

ng, he

1-

en

of

itin id ve ng ss ure

h-

n-

1-

u-

le

rs,

BLOOMFIELD, N. J.





The new Butcher Type Handle on Model No. W85 WHALE Hack Saw Frames gives a better grip on all metal cutting jobs! Superbly balanced, fingerfitted grip of tough rubber composition. Fully enclosed protective design. Rugged Forsberg frame. Order this outstanding Hack Saw Frame from your Mill Supplies Jobber NOW!



operation; and standardized, interchangeable tooling. The unit is designed to handle work up to  $8\frac{3}{16}$  inches in length.

### Protectoseal "Air-Matic" Automatic Parts Washer

Known as the "Air-Matic," an automatic metal parts washer which is claimed to offer complete fire protection in the use of flammable cleansing solvents has been introduced by The Protectoseal Co., 1920 S. Western Ave., Chicago 8, Ill. Com-

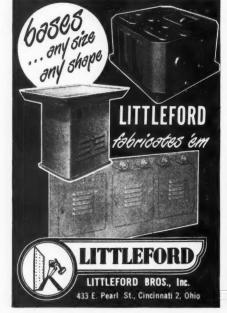




Protectoseal "Air-Matic" Automatic Parts
Washer

pact and portable, the washer can be set up alongside production machines or used in maintenance and repair shops. Washing of parts is accomplished by

Washing of parts is accomplished by moving a perforated basket, with contents, up and down through a solvent. According to the manufacturer, the Air-Matic is so designed as to produce the least possible turbulence and therefore permit maximum flow of liquids over the parts. The machine utilizes a reciprocating air engine which is said to be economical and efficient in operation and to also reduce the fire hazard to a minimum. In the event the contents of the washer







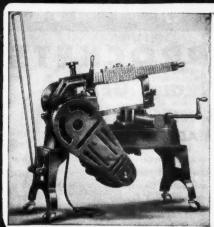
This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre . . . at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood. 4x361/4" band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW MANUAL ON FINISHING—WRITE TODAY

WALLS SALES CORP 306 E. 38th St., New York 16, N. Y



### SAWMASTER HACK SAW



LOW PRICED

### PORTABLE

SELF-CONTAINED

READY TO WORK

Angle

STURDY

**ECONOMICAL** 

Write for Bulletin No. 300

LER-KNUTH MFG. CO. OMAHA, NEB.

#### Small Machines DuoLathe

should become ignited, the cover is designed to automatically close and snuff out the fire, it is stated.

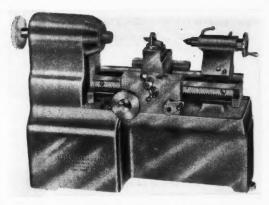
Said to operate on any compressed air supply, the Air-Matic Automatic Parts Washer is supplied complete with all necessary attachments.

#### DuoLathe

Known as the DuoLathe, a metal turning lathe for the machine shop, combining standard lathe facilities with the

highly specialized features of the regular jeweler's lathe, is now in production by Small Machines, Inc., 2010 S. Sepulveda Blvd., West Los Angeles 25, Calif. Extremely compact, the lathe measures 10½ inches long x 7½ inches high x 3¾ inches deep and includes a self-contained universal motor, mounted in the base.

The DuoLathe is said to be ideally suited for the machine shop, the toolroom, and the technician's laboratory, as



well as the watchmaker and the jeweler. In addition to the universal motor, standard equipment of the machine includes a foot rheostat, adjustable tailstock, tipover tool rest, headstock and tailstock centers, driver plate, headstock tapered and threaded sleeve, and power driven carriage with cross slide and tool post. The DuoLathe, which is modern in appearance with a highly polished body, has a speed range of from 100 to 3,000



# HUBER

## SPROCKETS

and GEARS

SPECIAL SPROCKETS
 MADE TO YOUR ORDER

We have the answers to your sprocket and gear problems—Roller and Silent Chain Sprockets; Spur and Spiral Gears. Phone, Write or Wire for Huber Personalized Service.

STOCK SPROCKETS

### HUBER GEAR & WHEEL CO.

Phone Des Plaines 901 1205 Harding Ave., Des Plaines, III. (Chicago Suburb)  20 YEARS SPECIALIZED EXPERIENCE





### CLEAR



1806 W. BELLE PLAINE AVE. CHICAGO • 13 • ILLINOIS



The RPM's stay up while grinding... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work—longer wheel life.

Buy Kipp air tools for best results, lower prices.





r.p.m. and is equipped with back gears which can be used to increase its power as much as twenty times.

#### Atlas No. 5010 Belt and Disc Sander

Identified as the No. 5010, a belt and disc sander for the efficient and economical sanding of small parts is now being offered by the Atlas Press Co., 2346 N. Pitcher St., Kalamazoo 13D, Mich. According to the manufacturer, the machine is designed to handle long, short,

Atlas No. 5010 Belt and Disc Sander

and wide metal, wood, and plastic stock presenting irregular shapes, edges, ends, curves, angles, and double angles.

The disc and drum spindles of the No. 5010 are ground, and the disc and pulleys are balanced. The spindles operate on

SKF ball bearings. Herringbone slots in the belt sander table top are said to keep the underside of the belt smooth. The disc able may also be used with the belt sander if desired. The disc and guard can be easily moved for sanding wide stock on the abrasive belt, which may be operated in both horizontal and vertical positions. The belt guard and stop are removable for sanding curved pieces on either belt drum.

Specifications of the Atlas No. 5010 Belt and Disc Sander are as follows: disc diameter, 10 inches; belt, 2718 x 4 inches; table, 7% x 15 inches; belt support table, 4¼ x 11% inches; rubber-faced belt





st

m

Io

01

# WOODRUFF = KEYS



We manufacture a complete line of Woodruff keys in all standard sizes. These sizes range from as small as ½" x 1/16" to keys as large as 3½" x ½". All keys are carefully checked for burrs, slivers, etc. before being shipped to you. Only the finished tested keys are permitted to leave our plants.

We carry a complete stock of high quality, dependable keys. Send for our catalog for complete information on Woodruff keys, taper pins, machine keys, and machine

racks.

### STANDARD STEEL SPECIALTY COMPANY

BEAVER FALLS

PENNSYLVANIA

PLANTS BEAVER FALLS, PA . HAMMOND, IN



SPEED UP production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments...no bearings, friction, heat or loss of power. Instant release without stopping lathe.

2-inch capacity, \$145; 3-inch capacity, \$295; 1-inch capacity, \$95

Round, square or hex collets, plain—serrated HALL MANUFACTURING COMPANY 622 Tularosa Drive • Los Angeles 26, Calif.

FROM TOP
TO TIP
They're Tip-Top!

B-RIGHT-ON
SOCKET SCREW PRODUCTS

For top quality that's always dependable, count on B-Right-On Socket Screw Products. Complete line includes Hollow Set Screws, Socket Head Cap Screws, Hollow Pipe Plugs and Stripper Bolts.

Production runs solicited.

Large, complete and centrally located stocks for prompt efficient service. Completely revised list prices and stock sizes. Write for your new copy.

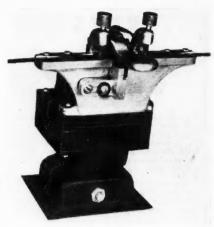
### THE BRIGHTON SCREW & MFG. CO.

Reading Road at Dorchester Cincinnati 2, Ohio drums, 31/4 inches in diameter; belt speed, 1,150 f.p.m.; spindle speed, 1,360 r.p.m.; motor recommended, 1/4 or 1/3 h.p., 1,725 revolutions per minute.

#### **Electro Band Saw Brazer**

The Erwood Co., 214 Woodstock St., Crystal Lake, Ill., has announced the Electro Band Saw Brazer illustrated herewith, which is designed to provide an efficient, economical, and simple method of brazing band saw blades. Although the





Electro Band Saw Brazer

unit is essentially a resistance welder,

brazing fluxes and materials are used. Light in weight and readily portable, the Electro Band Saw Brazer is designed to braze blades up to 1/2 inch wide and can be operated on any 60-cycle lighting circuit. With the equipment, welds can be produced in a very short length of time directly on the machine on which the band saw blade is used. The brazer consists of a high current transformer with two resistance electrodes arranged in a convenient clamping device to simplify its operation, and is supplied complete with a 6-foot a.c. cord with plug, as well as a generous supply of brazing material and brazing fluxes. Moreover, a com-plete set of instructions is furnished which explains in detail the method of procedure. In addition to band saws, the unit permits the brazing of coiled stock.





er.

ed.

ole,

ned ing be me

ith
a a
ify
ete
vell
ial
mned

of

he

ck.

248

### **PUNCHES and DIES**

TO FIT ALL MAKES OF PUNCH MACHINES

Large range of round, square, flat, and oval sizes are carried in stock for immediate shipment. Special Tools Made To Order.

Stock Lists Available.

T. H. Lewthwalte Mach. Co. 317 East 47th St., New York 17

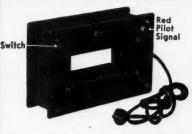
### GEARS GOOD GEARS ONLY

All Kinds—Any Quantity

AT THE RIGHT PRICE

THE CINCINNATI GEAR CO.
Woester Pike Cincinnati, Ohio

# AMC Quick | DEMAGNETIZER



A necessity where machine tools are used.

Standard units available.

Write today for descriptive circular.

ALOFS MFG. CO.

1622 Madison, Grand Rapids, Mich.



& n IPS

Accurately ground from the solid steel after hardening for long life and efficient production.

Thirty-six years of Fine Tool Making Experience is at your service.



Our new 109 page No. 8 Catalog is ready for mailing. A request on your letterhead brings it.

Next time try R & N Taps.

REIFF & NESTOR COMPANY

manufacturers of TAPS AND REAMERS

LYKENS, PA.

### "Grampus" High Speed Shear

Known as the "Grampus," a high speed shear designed with an unusually small head and base to permit wide variation in work shape is announced by the Federal Machinery Co., 134 Grand St., New York 13, N. Y. Material of practically any odd shape can be easily placed of shear the strength of the strength

head or under the base for quick, efficient, and burr-free cutting, it is claimed.

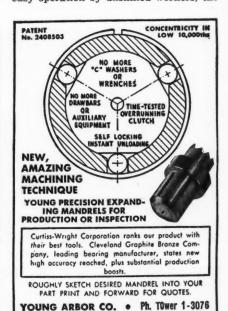
According to the manufacturer, the Grampus High Speed Shear is excellent for fast inside cutting, both straight and contour, by means of a simple locking device. No starting hole is required for inside work. Rated up to and including 14 gauge mild steel, the machine provides for finger-tip control of the stroke and rapid adjustment of the cutting blades



for very light material, and is designed to handle pipe work, pans, channels, tubes, shells, and so on, of various diameters and depths within the limits of its 7-inch throat.

Ruggedly constructed for heavy duty but unusually compact, the Grampus weighs 100 lb. including its ¼ h.p. motor, and features a direct coupling drive, eliminating the need for belts. Designed for easy operation by unskilled workers, the





2140 Scranton Road,

Write for Catalog and Templates on

M-T Fixture Clamps and Components.

MORTON MACHINE WORKS

Detroit 20, Mich.

Cleveland 13, Ohio

2424 Wolcott

### Imported-SWISS

### **Collets and Carbide Bushings**

### FOR SWISS TYPE SCREW MACHINES

Most fractional sizes shipped from stock.

G and D Sales Co.

111 Dillerville Road

to

es,

ers

ch

ity

us

or, m-

or

he

Lancaster, Pa.

### **60 YEARS MANUFACTURING**

Multiple Spindle Drilling and Tapping Machines • Automatic Drilling and Tapping Units • Multiple Spindle Attachable Drill Heads • Hot and Cold Swaging Machines • Hammering Machines • Tools, Jigs and Fixtures • Contract Work • Special Machinery.

LANGELIER MANUFACTURING CO.

Providence 7, Rhode Island

### Why THOR STAMPS Last Longer



... because they're made of a special, correctly - heated alloy steel. Central striking point assures uniform marking. Thumb side marking assures easy use.

You get more mark per dollar with THOR STAMPS. Write for catalog and prices.

The Pittsburgh Stamp Co., Inc.

### INDUSTRIAL DIAMONDS DIAMOND TOOLS



layers containing a total of 20 diamonds. Multiplicity of cutting points; depending on diameter of wheel, four or more diamonds will always contact the wheel, giving finer dressing and precision finish. Recommended in all straightfaced dressing and truing on wide-faced, hard silicon carbide wheels. Used most effectively on Norton Cylindrical, Landis Cylindrical, Cincinnati Cylindrical Grinder and (with special Adapter) on Cincinnati Centerless Grinder.

Requires fewer passes across the wheel. Generally used with fast dressing traverse.



31 W. 47th St., New York 19, N. Y.

#### Representatives:

Buffalo — Schoenborn Abrasive Sales Co., Box 41

Chicago—J. R. Mendelssohn, 4744 Woodlawn Ave.

Cleveland—John P. Roberts, 501 Perry Payne Bldg. South Bend—Formrite Tool Co., 1311 W. In-

diana Ave.

Toledo—W. C. Sorgen Co., Box 207, Sta. B.

Moline — L. R. Christiansen Co., 617 15th Street. Milwaukee — Redi Products Co., 211 South 2nd St.

"There is no economic substitute for diamonds."



### OUTPRODUCES OTHER CARBIDES!



ITPIL	AL GASES	FRUM	OUK H	LE2
Facing e	nds of Co	st Iron	Valve	Body:
Piec	es per gr	ind TE	CO	200
Best	previous	carbid	e	60
Slotting	Circulan	54001 S		

Pieces per grind TECO..... Best previous carbide..



### A job run proves it!

Production increases of 100, 200 and 300% over other carbides, are common with TECO Cemented Carbide. Prove it yourself on any turning, boring and facing job. Get more pieces per grind, more grinds per tool, less down time, lower tool cost.



Specify TECO when ordering carbide tools from your distributor or fabricator. Complete line of tools and blanks.

#### 562 39th St. TUNGSTEN ELECTRIC CORP., UNION CITY, N. J.

Manufacturers of Tungsten Carbide-from ore to finished material-for over a quarter century.



shear is said to be ideal for trimming drawn metals and stampings. Its use is recommended especially for modelmakers, shops devoted to small cutout work, aircraft and automotive parts, hollowware and silverware manufacture, metal signs, and so on.

### Beverly All-Steel Shear Stand

Announcement of the development of a tripod type, welded all-steel shear stand has been made by The Beverly Shear



Beverly All-Steel Shear Stand

Mfg. Co., 3000 W. 11th St., Dept. 3, Chicago 43, Ill. Designed primarily in answer to the need for a rigid, lightweight support for the company's throatless and slitting shears, the stand is readily adaptable to many types of machines and tools.

Tubular supporting and bracing members provide the necessary rigidity and strength yet do not add appreciably to the weight of the stand, it is stated. The legs have suitable holes for any desired method of anchoring the stand, the SUTTONS AS THE SPINDLE

Diamond

STOPS

SUTTON TOOL CO

Style "F" Full Floating Master Collet with Interchangeable, Replaceable Jaws. For Hot Rolled Stock.

- Each jaw floats independently with full bearing on stock.
- Jaws grip tightly with one-third less tension.
- Jaws made with patented Diamond Grip Serrations.
- Prevents slippage-reduce scrap-reduce strain.
- One master per machine—jaw assortment for full range.
- Jaws quickly, easily changed—saving set up time.

"Only Sutton Collets Are Diamond Serrated"

SUTTON TOOL COMPANY STURGIS, MICHIGAN

SUTTON COLLETS

tripod design of which is claimed to compensate for uneven or irregular floors. The top mounting plate, measuring 7 x 11 inches is of heavy gauge steel, accurately placed and welded to bring the mounted shear to the most efficient position for shearing.

Normally, the stand is furnished with the mounting plate drilled to accommodate Beverly throatless or slitting shears. A blank top for mounting other machines or tools is available if specified. The stand weighs 25 lb., measures 30 inches in height, and is finished in attractive medium gray machinery enamel.





Aero Spiral flute HSS Co-sinks end chatter, cut clean and accurately. Stocked in 60, 82, 90, 100 degree included angle, 3/6, 1/2" diameter, with 1/4" shank and 3/4", and 1" dia. with 1/2" shank. If not available from your Mill Supply dealer order direct.

AERO TOOL COMPANY 6930 Avaion Bd., Los Angeles 3, Calif.

#### Hobart High Frequency Stabilizer

Product of The Hobart Brothers Co., Hobart Square, Troy, Ohio, the Hobart High Frequency Stabilizer illustrated



Hobart High Frequency Stabilizer

herewith is designed for use with ordinary a.c. or d.c. welders in inert-gas-shielded tungsten electrode welding; in sheet metal work and other applications involving low currents; in vertical and overhead welding; and with the twin carbon arc torch.

Especially developed to adapt ordinary a.c. transformer welders for "Heliarc" welding, the unit is said to increase the impulses from 120 per second to 4,000,000

### AIRLOX

**PNEUMATIC** and Hydraulic Vises

Jaw force: 90 times air-line pressure

Write for Data Sheet T

production devices, inc. whitehall, New York

# **Rod Grindin**

### STRAIGHT RODS

1/32" to 1/2" Diameter Diam. Tol. .0005" on Rods Up to 6' Long. Diam. Tol. .001" on Rods Up to 12' Long.

> **Quick Delivery High Quality**

14 YEARS OF COMPLETE CENTERLESS SERVICE

COMMERCIAL

6605 Cedar Ave., Phone: EN 3412: CLEVELAND 3.0.

### MARVECO LIVE CENTERS

- HIGH SPEED
- O LONG LIFE
- HEAVY DUTY

MARVECO - QUATanteed to outperform and outlast any other live cen-

SEND US

YOUR CENTER

PROBLEMS

MARVEL TOOL & MACHINE CO.

3401 E. McNichols Road,

Detroit 12, Mich.



Order Them Together

# STITES CAMS AND TOOLS

for Screw Machine Products

One source of supply and responsibility for your Brown & Sharpe cams and circular form tools is a definite advantage.

This is available at the Stites Tool Company where years of experience assures quality, accu-

racy and prompt service.

Here's one more priceless ingredient—Personal Service. Ask any Stites customer or better yet, try it yourself.



THE STITES TOOL CO.

1426 W. THIRD STREET . CLEVELAND 13, OHIO

in

18 d in

10



impulses per second. An intensity control is provided so that intensity of the high frequency can be adjusted to

suit the particular job at hand. The stabilizer is available in two sizes with maximum capacities of 300 to 500 amperes respectively.

### Graham Stud Welder

Product of the Graha m Manufacturing Corp., 1643 National Bank Bldg., Detroit 26, Mich., the Graham Stud Welder illustrated herewith features a capacitor-operated self-timed device using tip studs which, on coming in contact with the work and fusing, causes ionization that, in turn, allows a path for the main discharge current

of the capacitor to form an arc sufficient to melt both the full diameter of the stud end and the work-

# ANNOUNCING, NEW WALL RACK FOR SHIM STOR

Here's a new, sturdy, metal wall or bench rack which holds four cartons of rolled shim stock in gauges of your own choice. Twelve thicknesses from .001 to .012" available in brass or steel. No longer any need to buy a fixed assortment of gauges which might not be exactly the ones you want.

Each carton holds 6" by 100" of precision-gauge brass or steel. Ready for instant use without fumbling or waste. Packaged in handy dispensing cartons, it's easy to stock, easy to use, always protected. The rack will last indefinitely ... the cartons of stock are easily replaced as used.

ASK your industrial or automotive distributor today about the Laminated Shim Company line of precision, packaged stock. You'll find that he has a complete stock to meet your needs.



Holds the four gauges YOU want. Simply pull out the desired length of stock and snip it off. It's HANDY ... SAVES WASTE!

### LAMINATED SHIM COMPANY

INCORPORATED

GLENBROOK CONNECTICUT

### Why a Commander Tapper?

• Tapping capacity 0 to 3/4" with one tapper.

is

28

r

a.-

g

1.,

er

a.-

t-

ng

n-

es

n.

ne

nt fe-

k-

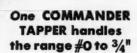
• Torque control—may be adjusted to protect any size tap. This assures safe bottom-hole tapping.

• Spring clutch drive eliminates slippage and wear . . . provides smooth, quiet, positive operation.

• Compactly built—affords maximum visibility of tapping operation.

• Furnished to fit any Drill Press.

Write for circular and name of your nearest Distributor.



COMMANDER MFG. CO.

4224 W. Kinzie Street Chicago 24, Ill.

Product of Commander . . . Builder of the Multi-Drill



### HAND-CUT STEEL STAMPS Letters & Figures

Deep, hand-cut letters in special-formula steel—result of 90 years of die making—assure clean impressions and long service. Face of stamp is empled for extra strength. Ideal for parts and tool marking and numbering. Also made in reverse for marking molds and dies. At mill supply houses.



HOGGSON & PETTIS MFG. CO., New Haven, Conn.

piece directly under same. This action is followed by the necessary hammer blow to cause the pieces to weld. The complete cycle is effected by a rapid, continuous movement of the stud-holding part, no retarding means being employed. The time of the arc is approximately 1 mil second, thus allowing for the use of very high currents.

According to the manufacturer, advantages provided by the Graham Stud Welder include concentration of heat; the welding of studs on very thin metal; no distortion of work; no discernable heat; the welding of studs on the back of plated or painted surfaces without marring; elimination of flux; welding of dissimilar metals; low energy consumption; easy operation by unskilled workers, and so on. Some of the metals and alloys which can be welded with the machine include stainless steel, Monel, aluminum, magnesium, zinc, copper, and, in some cases, combinations of these metals and alloys.

c

a

10

it

e

fl

0

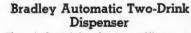
ti

P

C tı

is

Available in portable and stationary models, the Graham Stud Welder can be used with studs up to 1/2 inch and has a current rating of 110/220/440 3-phase a.c. No timing devices are required; a foot pedal or switch can be used on manual cycle times. The welding pressure can be either mechanical or pneumatic.



For industrial plants, offices, and other places, C. C. Bradley & Son, Inc., 432 N. Franklin St., Syracuse, N. Y., is now offering the automatic two-drink dispenser illustrated herewith. Designed to serve two persons simultaneously, the machine is capable of dispensing 800 drinks-400 each of two flavors-before reservicing. The syrups are contained in stainless steel tanks which are said to be easy to keep clean. All syrups are precooled to approximately the same tempertaure as the carbonated water.

The valve mechanism of the Bradlev Automatic Two-Drink Dispenser is constructed on a dispensing principle which is claimed to eliminate variations in the quality or quantity of each drink. With the mechanism, each drink is accurately measured in a separate chamber before being dispensed, thus assuring not only a drink of uniform size but an exact amount of syrup and water mixed under pressure.

The cylindrical cup dispensing arrangement located on each side of the machine





### REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long soughta more accurate and surprisingly faster way of trans-

ferring blind screw holes.

The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in 18" to 1" diameters. Send for price list.

HEIMANN MFG. CO.

330 Lincoln Ave.

Urbana, Ohio

directly over the cooling chamber includes a "cam" mechanism which separates each cup before dispensing, thus eliminating the danger of cup failure no matter how heavy the volume may be and assuring the dispensation of a cup as long as there are cups in the magazine, it is claimed.

g;

lar

sy

SO

ch

de

g-

es,

ys.

ry

be

a

.c.

oot al an

nd

c.,

is nk

ed

he

300

re

in

to

re

ne

ev

n-

ch

he

th

ly

re

lv

ct

er

e-

The cabinet construction consists of a combination of heavy sheet steel and fluted stainless steel trimming mounted on an angle iron frame. The cabinet is in sections and is enameled in various color



Bradley Automatic Two-Drink Dispenser

designs. Should any section of the cabinet become damaged or marred, that particular section can be easily replaced.

### Montgomery Type C Portable Elevator

A light duty hand-operated portable elevator designated as the Type C is announced by Montgomery & Co., Inc., 53 Park Pl., New York 7, N. Y. The unit is constructed of lightweight mechanical tubing and lifetime bronze bushings and is equipped with a handy push bar to facilitate moving, an easily-operated floor lock, a self-locking safety type winch, and a three-speed handle adjustable for light, medium, and heavy loads. The gears of the unit operate in a grease bath. Specifications of the Montgomery Type

# M.F.P. MACHINE SHOP FLOOR PATCH



### GREASE & OIL RESISTANT Shipped in Complete Unit!

FLEXROCK M.F.P. has been carefully developed to meet and overcome the conditions existing in machine shops. Thorough tests have proved that it offers so much resistance to grease and oil disintegrators as to give absolutely satisfactory service on machine shop floors.

### **ADVANTAGES**

- M.F.P. offers extremely high resistance to oil and grease, is shockproof and provides the maximum of foot-ease and light reflection.
- (2) M.F.P. is far more grease resistant than other patching materials. It requires only ½ inch "chip out" around edges.
- (3) In addition to its shatter-proof properties, M.F.P. has a surface hardness and smoothness reducing load-drag to the minimum.
- (4) M.F.P. can be applied over concrete or wood, and is of the same color as concrete.
- (5) It is shipped as a complete unit—there is no sand, stone, cement nor any other material to buy.
- (6) M.F.P. is extremely easy to apply and a good job can be done by anyone who will follow the simple directions.

Write for New Folder

FLEXROCK CO. 3615 FILBERT STREET

M.F.P.

(MACHINE SHOP FLOOR PATCH)



# \*VAC-IT

- for FAST
  - SAFE
  - EASY CLEANING

### FACTORY OFFICE SHOP

Vac-It is fast and efficient with more than enough power to handle any cleaning job in your plant.

Vac-It is safe. Every part is enclosed for protection to the operator and for better performance under all working conditions.

Vac-It is easy to use and simple to handle, requiring a minimum of time and labor. Engineered cleaning attachments do the reaching and stooping for you.



DOYLE VACUUM CLEANER COMPANY 3225 Stevens St., S.W., Grand Rapids 7, Mich. C Portable Elevator are as follows: capacity, 750 lb.; overall height, 69 inches; overall width left to right, 25 inches; overall distance back to front, 39 inches; casters, 4 inches in diameter (two swivel and two stationary); platform, 24 x 24 inches; minimum, height, 6 inches; and maximum height, 53 inches. The unit is also available, on special order, in other

08

SI

th

bu



Montgomery Type C Portable Elevator

capacities for both hand and electric operation and with various size platforms and heights.

### LeMaire 2-Way 4-Spindle Horizontal Drilling Machine

Especially designed for drilling cross holes in steering idler arms, the LeMaire 2-Way 4-Spindle Horizontal Drilling Machine shown herewith, product of the LeMaire Tool & Manufacturing Co., 2657 S. Telegraph Rd., Dearborn, Mich., consists of a rigidly fabricated steel center base

LeMaire 2-Way 4-Spindle Horizontal Drilling Machine

el 24

nd

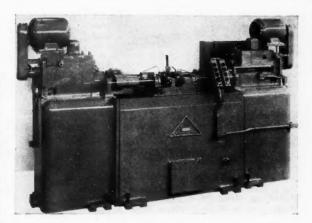
is

er

with two end bases on each of which is mounted a No. 1000 hydraulic unit driving and feeding a 2spindle head. The head is mounted on guide bars with the forward end of the guide bars supported by brackets which are an integral part of the workholding fixture. The fixture is arranged to hold two parts and, at each cycle of the machine, 0.182-inch holes are drilled in the opposite side of a yoke on each

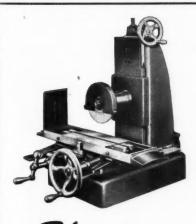
of the two arms. A generous supply of coolant is provided from a coolant tank built into the base of the machine.

The machine is driven by a 1½ or 2 h.p. motor and, since it is used with small tools that do not require a heavy thrust, a single ram only is used to provide the hydraulic feed. The feed rate is 135 inches per minute for rapid approach and re-



turn, and the slow feed can be varied from ½ to 35 inches per minute by merely turning a dial. Movable cams, mounted on a cam bar, control the length of feed up to a maximum stroke of 4½ inches.

The same motor that drives the spindle also drives the hydraulic pump. The pump speed is kept constant with the spindle speeds being varied from 365 to



# Thornton MECHANICAL LABORATORY

### HAND FEED PRECISION SURFACE GRINDER

Bench and floor types.

Quick and easy in operation. The platen can be moved by one linger.

Grinds 12 in. long x 6 in. wide x 9 in. over platen. 7 in. dia x ½ in. face x 1¼ in. hole wheel.

Motor 1/2 or 3/4 H.P.

Precise control for precise work. Repeated purchases indorse it.

NEW BRITAIN, CONNECTICUT

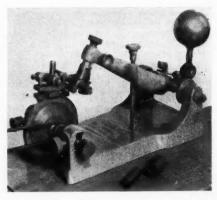
S.

4,810 r.p.m. by using various pairs of speed change gears, which are easily replaceable. The spindle may be arranged with a flange for use in mounting a multiple spindle head, as shown in the accompanying illustration, or may be used with a single spindle unit with No. 2 or 3 Morse taper. Units may be mounted horizontally, vertically, or at any angle. According to the manufacturer, helical gears are used in all heads and hydraulic units.

### Macduff Cemented Carbide Sawing Machine

A gravity feed cemented carbide sawing machine is now being introduced by Howell G. Macduff Co., 91 Prescott St., Worcester 5, Mass. Driven from a line shaft or individual motor, the machine is said to cut round, rectangular, square, or triangular pieces with a minimum amount of attention on the part of the machine operator.

The Macduff Cemented Carbide Sawing Machine utilizes standard 4-inch diamond impregnated cut-off wheels or laps which are kept clean and free cutting by a saturated wick or piece of felt. The rate of feed is determined by the adjustment



Macduff Cemented Carbide Sawing Machine

of a ball weight on the work arm, thus reducing the time consumed in cutting to a minimum.

### Acme Type PT-O Welder

The Acme Welder Co., 2618 Fruitland Rd., Los Angeles 11, Calif., announces a projection welder designed for fast, ec-



### 5 IN. ROTARY TABLE ON ADJUSTABLE ANGLE PLATE

for SMALL and FINE CIRCULAR MACHINING CAN BE PURCHASED SEPARATELY

Accurate — Dependable

Write for Bulletin We Also Make Four Larger Sizes.

JOHN B. STEVENS INC. 482 Canal Street

New York 13, N. Y.



Bullotin M-12.

CENTER SCOPE PRODUCTS

3829 San Fernando Rd., Glendale 4, Calif.

le

le

es

P

fe

tı

tl

fo

to

K

onomical operation on light jobs. Designated as the Type PT-O, the unit is an air-operated, press type, direct-action projection welding machine which is available in capacities of 20, 30, and 40 kva. Horn adapters and horns for converting the machine to conventional spot welder use can be supplied if the user so desires.

Equipment of the Acme Type PT-O Welder includes a solenoid operated air valve with either a single-stage or two-



Acme Type PT-O Welder

stage foot switch. The standard throat length of the machine is 6 inches; when converted to a spot welder, the throat length is increased an additional 6 inches. The small, compact size of the Type PT-O permits full power capacity to be utilized, thus making it an ideal welder for so-called light work, the manufacturer claims.

The accompanying illustration shows the Acme Type PT-O Projection Welder equipped with a two-stage toe-operated foot switch. The operator is welding a stud in a stainless steel frying pan cover to which the cover handle is attached. Kitchen utensils are said to be one of the many classes of work especially suited to the machine.



# ...Have You Seen the NEW Catalog by RELTOOL?

This attractive new book belongs in your files. Illustrates and describes the Complete, Augmented Line of Reltool Metal Cutting Tools which includes:

- Center Drills—Standard and "Shockless" Regular and Bell type.
- ess" Regular and Bell type.

   End Mills and End Mill Holders.
- Small End Mills—Special High Speed
   ground out-of-the-solid.
- Milling Cutters All Types Key Seat Cutters, Form Tools.
- Metal Slitting Saws All Types Side Chip Clearance and Screw Slotting Saws.
- Special Saws Rotary Shears, Formed Tooth Saws, Tenacious Saws, Jewelers Saws, and others.
- Reamers, Center Reamers, Counterbores, Taps.
- Cut Off Blades, Tool Bits-All Grades,
- Accessories Driving Collars, Equalizing Collars, Stub Arbors, Lathe Mandrels.

Get acquainted with Reltool Metal Cutting Tools through this Complete, Attractive Catalog. Write for it, write nowl



A 5486-14

### Lyon-Raymond Die Handling

The Lyon-Raymond Corp., 6392 Madison St., Greene, N.Y., announces that its standard hydraulic high lift truck, designed to handle up to 3,000-lb. loads, is now furnished with a boom and chains for die separating. The boom extends 36 inches and includes hooks which are fastened to sliding rings so that large or small dies can be handled on the 30 x 36inch platform of the truck.

Easy elevation of the platform is effected by a heavy duty two-speed hy-



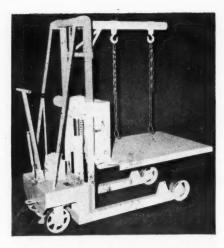
Shop Orders, Drawings, Blueprints, Etc.

Made in three styles, trans-parent, fibre, and metal backs. Non-inflammable acetate windows. Special style or size to order. Write for details.

INSTRUMENT COMPANY Phono: CEDAR 4728

1422 E. 109th St., Dept. M., Cleveland, Ohio





Lyon-Raymond Die Handling Truck

draulic hand pump. A winch with 15 feet of steel cable is provided for drawing the dies from presses to the truck platform. The platform has a range of elevation from 6 to 54 inches and, since the boom can be easily removed, the equipment is said to adapt itself to stacking, tiering, and many other handling operations. Stability is provided by the auto steer arrangement on the front wheels of the truck, which can be locked in position by a brake that engages the floor.

The Lyon - Raymond Die Handling Truck is of unique welded tubular and formed steel construction to provide maximum strength without unnecessary weight. The unit weighs approximately 1,100 lb. and has an overall height of 83 inches. If desired, the truck can also be obtained in 1,000 and 2,000-lb. capacities.



Square turret indexes within .0005" Rocker adjustments provided for tools. Mounts on cross slide of current models of South Bend Lathes, adaptable to others. Write for dimension sheet.

Prices (,o,b, factory	Size Lathe	Size Sq.	Takes Tools	Prices		
	9" 10" 13" 14%"	3" 3" 3" 4"	*" * *" *" * *" *" * *"	\$42 42	\$48 48 53 75	
HOLDS 4 TOOLS	PAT. PEND.	16"	4" Double Compa	%" x %" Tool Cross and Rest Cr	75 Slide M	80 lodel e Made

1819 W. 16TH ST.

CHICAGO 50, ILL

Schmidt Model 295 Bar Marking Machine

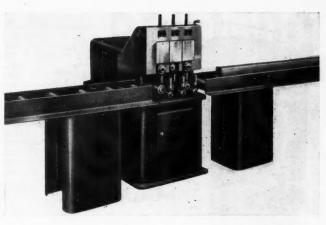
#### Schmidt Model 295 Bar Marking Machine

For permanently identifying bar material, Geo. T. Schmidt, Inc., 1806 W. Belle Plaine Ave., Chicago 13, Ill., is offering the Schmidt Model 295 Bar Marking Machine shown herewith. Bars to be marked are fed between the rolls of

the machine, from which they are ejected after marking. Flat, square, round, hexagonal, and structural or extruded shapes are said to be handled equally well at speeds varying from 70 to 210 feet per minute, the speeds being controlled

by a simple handwheel.

The Schmidt Model 295 Bar Marking Machine has a capacity for bar stock



from ¼ to 3 inches square. Perpendicular adjustment of the rolls is effected by means of a single handle located at the upper right of the machine. Horizontal adjustment of the guide rolls is made by three crank screws which operate a right and left threaded screw to maintain the marking in the center of the face. Bars may be marked on one side only or on





NO WELDING! NO SLEEVES! NO SHORTENING! NO DISTORTION! GUARANTEED STRONG AS NEW!

Send them to us like this



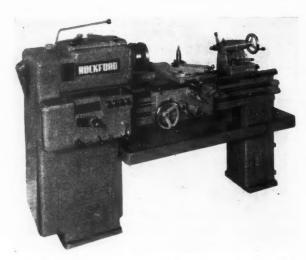
We return them like this



Exclusive NU-TANG process t replaces twisted or broken tangs on any tool with a Morse taper (sizes 2 to 6). Any tool-drills, reamers, countersinks, cutters, drivers-repaired perfectly with brand new tangs. Amazingly low cost. Satisfaction guaranteed. NU-TANGS are used by leading industries. Send tools for prompt repairs - or write for prices

and literature. + Patent Pending

4110 Spring Grove Avenue Cincinnati 23, Ohio



Rockford 14-Inch Economy
Lathe

The lettering knurls can be quickly changed by the removal of a single screw.

The roller bearing feed and discharge tables of the machine have an overall length of 10 feet each and are mounted on retractable ball bearing casters for quick and easy mobility.

opposite faces by using opposing lettering knurls.

The engraved knurls utilized in the Model 295 are 3 inches in diameter so as to permit continuous marking or marking at desired intervals up to 9-inch centers.

### Rockford 14-Inch Economy Lathe

A medium size, general purpose lathe of improved design has been introduced by the Rock-

a

ir n o

el d

12 fo

to

eı

111

th

er

rath

fo

da

W

po

al

le

st

De

ford Machine Tool Co., Rockford, Ill. Known as the Rockford Economy Lathe, the machine features a carefully built all-geared headstock with a range of twelve spindle speeds, all quickly adjustable by means of conveniently

# Again NEW, LOWER PRICES FOR LEMPCO ANTI-FRICTION DIE SETS

This third recent major price reduction is a prompt reflection of lower manufacturing costs.

Your enthusiastic acceptance of Lempco Anti-Friction Die Sets has allowed us to step-up production schedules and add more time-saving machine tools. We've been able to cut costs on our latest model—and, in the American tradition, pass our savings along to you.

The new Lempco Microlex Die Set gives you all the advantages of anti-friction construction: increased die life . . . faster, more accurate production . . . greater economy.

Write today for your new price list and specifications for Lempco Microlex Anti-Friction Die Sets. At their new, lower prices, Microlex is more than ever the best value your dollar can buy.

### **LEMPCO Products, Inc.**

5756 DUNHAM ROAD



Licensed under the inventions of Guy Connor. U.S. Patent Nos: 2,422,774—2,422,775

Preloaded anti-friction bearings between leader pins and bushings bold punches and dies in perfect alignment. And, they allow sets to open and close freely and easily . . . save assembly and try-out time . . . cut costly downtime.

BEDFORD, OHIO

located levers. To ensure maximum accuracy and long life, the spindle is made from a high alloy steel forging, mounted on Timken zero-precision bearings. The spindle nose has a No. 1 tapered key drive.

Headstock gears are cut from preheat treated steel gear blanks, annealed, hobbed and shaved to obtain high precision and smooth operation. Positive gear lubrication is assured by an immersion and oil-splash system. The overall design of the headstock allows for the performance of all types of lathe operations, including those ivolving high spindle speeds and the use of tungsten carbide cutting tools.

arbox, carriage, apron, and drive arbox, carriage, apron, and drive are on a similar level of precision design, as the headstock. Pick-off change gears, reverse gears, V-belts, and similar parts and assemblies are easily accessible for adjustment or repair through the hinged door on the headstock end of the lathe. All moving parts, with the necessary exception of the spindle nose, are well protected to provide full safety to the machine operator.

#### Graham Model A-E100 Punch Press Guard

Particularly designed for any size of inclinable direct clutch press that does not require more than a 150-lb. pull to operate the present foot trip, an air and electrically operated punch press guard designated as the Model A-E100 is announced by the Graham Specialty Co., 12925 Auburn Rd., Detroit 23, Mich. The foot treadle is replaced by an air thruster. and a set of push buttons for each operator is installed in a convenient place on the press, the buttons being located far enough apart so that the operator must use one hand on each button. Only by simultaneously pushing both buttons, is the circuit completed, and the air thruster releases the clutch, thus allowing the ram to make one complete revolution in the same manner as when tripped by the foot treadle. Both hands are out of the danger zone when the ram descends, but are ready to pick up the next piece of work.

The foot treadle can be either temporarily disconnected or permanently removed if desired. An anti-repeat switch allows the ram to descend only once unless the solenoid valve is re-energized by the use of the two start buttons. A foot attachment for the handling of long stock may be furnished. Plugging of the





ECONOMICAL- ACCURATE

IN STOCK, ready for immediate delivery, all A. S. A. STANDARD types and sizes. Exceptionally fast delivery of NEW GAGES and Gages salvaged by HARD CHROMIUM PLATING.

Bulletin and Price Lists sent promptly upon request.



TOOL & MACHINE CO.

1827 S. 68th St., Milwankee 14, Wis.

attachment into the press for blanking purposes provides an automatic operation to the press, thus making the start buttons inactive. Micro-Limit switches can be installed in the circuit on interlocking dies so that the press cannot be operated unless the die or work is in the "home" position. Even then, the press can only be operated with the start buttons, thus eliminating possible major damage to the press or dies, it is claimed.

Designed for easy installation, the Graham Model A-E100 Punch Press Guard consists of an air thruster, anti-repeat switch control.



J. L. LUCAS & SON, INC. BRIDGEPORT 5, CONN.



Graham Model A-E100 Guard Installed on a Punch Press

tor, and two start buttons, and is supplied complete with a wiring diagram and instruction sheet.

### STERLING DRILL GRINDER



"Red Ring" Fast-Lock Tailstock and Automatic Splash Guard Door for Gear Shaving Machines

To materially reduce operator effort

To materially reduce operator effort and fatigue and at the same time increase production rates, the National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich., has added to its line of "Red Ring" equipment a fastlock tailstock and automatic splash guard door for gear shaving machines. Designed to reduce the operation of load-



ATLANTIC GEAR WORKS, INC. 198-A Lafayette St., N. Y. 12, N. Y. CAnal 6-1441

McDONOUGH MANUFACTURING CO.

FAU CLAIRE WISCONSIN, U. S. A.

"Red Ring" Gear Shaver Equipped with Fast-Lock Tailstock and Automatic Splash Guard Door

ing the work to one motion and the same for unloading it, the fast-lock tailstock includes a screw advance and locking mechanism which enables the operator to fully lock the work merely by pushing the handle away and to retract the tailstock for unloading merely by pulling the handle toward it. As soon as the center is seated in the arbor or part, it is said to lock positively, eliminating the necessity of jamming the handle to secure the locking.

The air-actuated electrically controlled automatic splash guard door is available in several designs to meet varying con-

a

al

ts t-

ıh

s.

ditions. With this device, after loading the work, the operator presses a start button, thereby automatically closing the door, starting the coolant flow, and initiating the cutting cycle. The cutting cycle



is performed automatically and, when terminated, the coolant is shut off and the door opens automatically, leaving the finished part ready to be unloaded by the operator.



# Top Rim STEEL STACKING BOXES 18" x 12" x 6". 16 Ga. with Drop Handles

STANDARD SIZES

16 x 10 x 6....18 Ga. 16 x 10 x 6....16 Ga.

18 x 12 x 6....16 Ga. 18 x 12 x 8....16 Ga.

MADE IN OTHER SIZES

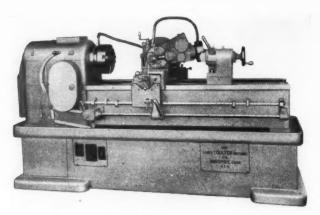


#### WE MANUFACTURE ALL TYPES OF STEEL BOXES

We make a specialty of boxes made to fit your particular handling requirements Special boxes designed so they can be run thru with standards enable us to quote prices comparable with that of a standard box.

STERLING FACTORY EQUIPMENT CO.

183 CHARLES ST. PROVIDENCE, R. L



Coulter Model TM
"Thread Master" Thread
Milling Machine

work spindle and cut-

ter spindle are each driven by individual two-speed motors which provide a wide range of speeds for hard and soft materials of large and small diameters. The speed of the work spindle is changed by pick-off gears, and with the standard gears furnished, 29 spindle speeds in each motor speed range are obtended.

tainable, making a total of 58 different spindle speeds.

The cutter spindle is driven by a twospeed motor which is said to provide cutter speeds up to 300 r.p.m. when using high speed steel cutters and up to 900 r.p.m. when using carbide-tipped cutters. With the standard gears furnished, U. S. form, Acme, and worm threads from 1 to 20 per inch can be produced and,

#### Coulter Model TM "Thread Master" Thread Milling Machine

Product of The James Coulter Machine Co., Bridgeport, Conn., the Coulter Model TM "Thread Master" Thread Milling Machine illustrated herewith is a single cutter type designed for thread milling operations on long operating screws. The

#### AUTOMATIC CHUCKING AND INDEXING FIXTURE



1.-1800 light cuts per hour.

2.—Either horizontal or vertical position. 3.—Collets changed instantly.

4.—Automatically knocks piece out.

Model D—Ratchet indexing only—I" cap.
Model E—Both degree and ratchet indexing

—Capacity up to 1".

Model F—Both degree and ratchet indexing
—Capacity up to 214".

Write for Folders

J. W. DEARBORN . Ansonia, Conn.

### THE ERRINGTON ADJUSTABLE DRILLING HEAD

This versatile tool permits you to take advantage of a wide range of adjustment without overhang. ERRINGTON Adjustable Drilling Heads can also be supplied with three spindles for equal adjustment in line and three, four, five or six spindles for equal adjustment on bolt circles. Range from 0 to 1½" drills.

FEATURES: Fully geared.
Needle bearings on all spindles in head. Ball thrust bearings throughout. Bronze bushed. Sand cast aluminum case. All parts fully enclosed for pressure lubrication and protection. Nonslip positive clamping on all adjusting members.
Send blueprint, sketch or sample for quotation—no obligation.



Established 1891

ERRINGTON Mechanical Laboratory, Inc.

Main Office and Plant:
STATEN ISLAND 4, NEW YORK

on diametral pitch worms, pitches from 7 to 20 can be cut. When cutting multiple threads, leads from ½ to 3 inch are ob-

tainable.

The Model TM Thread Master has capacity for swinging work of 10 inches in diameter over the cross slide or 16 inches over the ways of the bed, and features a 4-inch diameter hole through the spindle which allows for the use of air-operated collet chucks so that long work of 4 inches in diameter or less can be inserted through the spindle. The machine is equipped with rapid traverse in the opposite direction of the threading travel, and the speed of the spindle in rapid traverse is said to be constant regardless of the threading speed of the work spindle.

The cutter spindle is driven through V-belts, spiral bevel gears, and worm gears, and all drive shafts are mounted on anti-friction bearings. The cutter spindle drive includes balance wheels on both ends of the drive to smooth out the transmission of power to the cutter. Each motor has its own control for changing the direction of rotation and speed of same, thus simplifying the milling of right and left-hand threads with climb or conventional cut.

The Coulter Model TM Thread Master is produced in three bed lengths so as to accommodate work between centers

of 24, 42, and 60 inches.

### Topflight Tape

A printed, pressure-sensitive cellophane and acetate tape which can be used effectively to mark parts, code tool steel, and identify component parts is now being produced by the Topflight Tape Co., Division of Topflight Tool Co., Inc., York, Pa. The tape, which may be used for instruction and warning labels and for name plates, is similar to the transparent or colored tape that is used to seal packages and envelopes or repair pages in a book.

Said to stick easily and quickly and to hold firmly, the Topflight Tape is available printed to order in a wide range of

color combinations.

### Air-Electric Control for Steelweld Presses

Air-electric control has been adopted as an optional feature available for all Steelweld presses manufactured by The Cleveland Crane & Engineering Co., Wickliffe, Ohio. The control equipment



. with these 2 MACHINES

The MILWAUKEE DIE FILER

Model FS with new All-Purpose, Deep-Throated Overarm performs all tool and die-making operations efficiently, at low cost.

Files, saws and lapping sticks chucked at upper end. Spring tension adjusted in overarm chuck. Chucking close-to-work assures rigidity of saws and files. Table tilts 15° in four ways. Lower chuck has ball-iointed jaw for true alignment of files with crooked shanks.

### The MILWAUKEE PROFILE GRINDER

**Built for Precision Grinding** 

Available in two models — STANDARD and HIGH SPEED . . . for mounted stone wheels

and diamond or carbide wheels respectively. 1/2 H.P. Ball Bearing Motor maintains high spindle speed at Full Capacity... no stalling. Permits use of larger wheels. Collet-Chuck assures true-running wheels; permits fast, easy



permits fast, easy mounting or removal of wheels. Built-in Diamond Wheel Dresser always ready — no loose parts to assemble. Write for Bulletins and name of nearest dealer

### RICE PUMP & MACHINE CO.

Division of Milwaukee Chaplet & Mfg. Co.

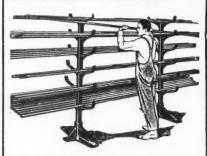
1041 S. 40TH STREET • MILWAUKEE 4, WIS.

## MILWAUKEE

DIE FILERS • PROFILE GRINDERS



Each BROWN SECTIONAL RACK combines five major and several minor features of design, all of which save money for its owner. The time previously lost in end-hauling each bar of stock its entire length from the old-style, closed-side Rack is saved by the Brown Rack which requires but a few inches of side movement.



Each length, width and thickness of stock is displayed in Gold-Fish visibility for instant selection and workmen waiting for stock are served without waste of time. The BROWN SECTIONAL RACK is a simple, durable article built in five styles from standard inter-locking metal sections. It cannot burn, sag or twist; unattached to the building, it can be moved at will. Changes in length of stock can be met by moving the units nearer or further apart, while increases of stock can be met by simply adding more standard units. Built from metal thruout, depreciation is practically nil. SEND FOR BULLETIN 26-M.

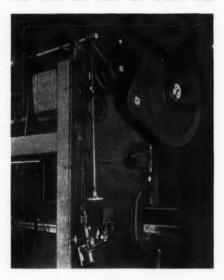
**BROWN SECTIONAL RACK** 

BROWN ENGINEERING CO.

120 N. THIRD ST. READING, PA.

includes an air cylinder for throwing in the clutch of the press. The cylinder can be actuated by a hand button, foot switch, or various combinations of both. A selector is usually incorporated in the air-electric control circuit to provide various ram movements such as long stroke, short stroke, continuous operation, and inching.

The accompanying illustration shows the air-electric control equipment mounted on the left end of a Steelweld press. The clutch and brake are located near



Steelweld Press Equipped with Air-Electric Control

the top of the machine and are operated by a common shaft that is equipped with a heavy spring which normally keeps the brake engaged. This shaft is moved by the air cylinder through a long vertical rod connected to a toggle joint.

#### Black Model DA Nail Making Machine

Designated as the Model DA, a heavy duty all-steel nail making machine which is so designed that noise and vibration are said to be reduced to a minimum is now being manufactured by Black Industrics, 1400 E. 222nd St., Cleveland, Ohio. The cams, crankshaft, and feed mechanism

n

n. e

8.

h

S

d

re

S,

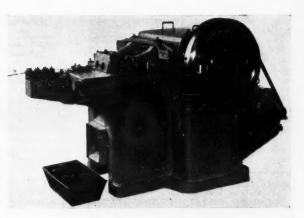
e

m

of the machine are pressure lubricated, and the circular crosshead floats on a film of oil. The heattreated alloy steel crankshaft is counterbalanced, fully enclosed, and supported at four points by steel-backed cadmium silver bearings which are said to provide for an estimated life of 30,000 hours of hard service.

Operated by a 5 h.p. motor through V-belts to a safety shielded flywheel, the Black Model

DA Nail Making Machine has a delayed feed action so that the gripper does not pinch until the wire is fully stopped. The length of feed, covering a full range of sizes from ½ to 2%-inch nails, is adjustable while the machine is in operation. Number 10 to 14 gauge wire may be used. The complete unit with motor weighs a total of 5,110 pounds.



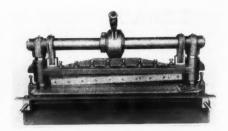
### "Di-Acro" Shear No. 4

Product of the O'Neil-Irwin Manufacturing Co., 306 Eighth Ave., Lake City, Minn., the "Di-Acro" Shear No. 4 illustrated herewith is described as a versatile "Die-Less Duplicating" unit which is designed to accurately and rapidly shear a wide variety of materials to extremely close tolerances. The rugged construction of the machine is said to as-



sure a high degree of accuracy in all duplicated parts.

The cutting range of the Di-Acro Shear No. 4 extends from the lightest of materials in plastics, fiber, mica leather, and rubber to heavy gauges of aluminum, cobalt steel, chrome molybdenum, leaded brass, and stainless steel. In all these materials, a clean cut free from rough edges or burrs is said to be assured because of the sustained accuracy built into the machine. Claimed to be especially adaptable to model, research, and experimental work, the shear has a maximum shearing width of 24 inches and a maximum ca-



"Di-Acro" Shear No. 4

### SEIBERT IMPROVED MULTIPLE SPINDLE DRILLING EQUIPMENT



pacity for 16 gauge sheet steel (0.062) inch. A gravity chute built into the heavy base casting is said to positively deliver all materials sheared.

The machine also includes a protracting gauge for squaring and mitering which can be quickly and accurately adjusted for any degree of angularity desired. Eighteen tapped holes are provided for locating this gauge, and any other fixtures, in numerous positions on the shear table. A material gauge can be mounted in back of the shear for the accurate sizing of stock or in front of the shear for the precision trimming of edges of parts. An additional rear gauge is provided which can be adjusted inward to the very edge of the lower blade, thus allowing strips of less than 0.025 inch in width to be accurately sheared. All material gauges can be readily set for a wide degree of angularity. Adjustable stops provide positive control of the shearing action for slitting and notching to die accuracy.

The shear blades are of alloy tool steel. properly hardened and precision ground. All four blade surfaces have a shearing edge. Adjustable bearings equipped with oil reservoirs for proper lubrication are provided.

SOMETHING NEW . . .

### TRUE CENTERS TRANSFERRED Instantly

East Peoria 8, III.

WITH UNIVERSAL TRANSFER PUNCH

No Layout, Measuring or Scribing required-Automatically centers and squares itself with finger tip pressure. (3 Sizes:  $\frac{1}{8} \times \frac{1}{2}$ ",  $\frac{3}{16} \times \frac{3}{4}$ " and  $\frac{1}{4} \times 1$ ")

Tool Specialty Salesmen Wanted

### Universal Transfer Punch, Inc.

Dept. M, Box 412,

Massillon, Ohio



LeBlond Regal Lathe with Standard Taper Key Drive Spindle Nose

The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio, announces that the standard taper key drive spindle nose is now being furnished in place of the threaded spindle nose on each LeBlond Regal lathe, the change-over having been effected without sacrifice of center distance capacity or any advantages associated with the lathe. According to the manufacturer, the addition of the standard taper key drive spindle nose to the Regal lathe, including the bench, floor, gap, and roll grinding models, allows for unusually easy and fast mounting of chucks and faceplates, since the operator merely has to line up the keyway of the chuck or faceplate with the spindle nose key and shove "home" the chuck. The loose fit of the thread in the coupling collar and on chucks or faceplates permits quick attachment and secure holding of the faceplate without binding.

With the standard taper key drive spindle nose, chucks and faceplates, it is claimed, cannot fly off the spindle even at high speed, and the danger of injury to operator's hands is also elim-

tg l-

9-

d

er

le

e

e-

e

to is

aa le

g l, d.



Close-Up View of LeBlond Regal Lathe Showing Standard Taper Key Drive Spindle Nose now Furnished as Regular Equipment

inated. Moreover, maximum accuracy and life are claimed to be assured since the bearing surface of the chuck or faceplate is not subject to wear and accuracy is therefore retained indefinitely.

## Make a Time Study

of NICHOLSON EXPANDING MANDRELS



Shop tests show that, with Nicholson expanding mandrels, operations can frequently be completed in less time than was formerly consumed in locating or turning a solid arbor. Set of 14 does work of 209 solid arbors. Two types; for all bores  $\frac{1}{2}$ " to 7"; sold singly or in sets. Used in shops the nation over.

BULLETIN 1043 shows how to save set-up time, promote precision with these widely used tools.

W. H. NICHOLSON & CO., 136 Oregon St., Wilkes-Barre, Pa.



Millholland Redesigned No. 5 Automatic Unit

The size of spindle nose now furnished on each Regal lathe is as follows: 13-15 inches (Model L00), 17-19 inches (Model L0), and 21-24 inches (Model L1).

## Millholland Redesigned No. 5 Automatic Unit

Product of the W. K. Millholland Machinery Co., 1048 Fairfield Ave., Indianapolis 5, Ind., the Millholland No. 5 Automatic Unit shown herewith has been completely redesigned to incorporate the latest improvements developed on the smaller size units, together with extra

h e a v y construction to withstand the hardest usage. The unit is shown mounted in an adjustable sub-base and equipped with a  $7\frac{1}{2}$  h.p. motor drive, although it is rated at 10 horsepower.

Improvements made include: new design of

pneumatic counterbalance; i m p r o v e d feed clutch; heavier spindle construction; increased support for spindle when used at maximum stroke; and liberal use of anti-friction bearings. Specifications are as follows: stroke, 6 inches maximum; motor drive, 5 to 10 h.p.; spindle, No. 5 Morse taper or arranged for multiple head drive; and height, 1,200 pounds.

The Millholland Redesigned No. 5 Automatic Unit is completely self-contained and individually motor driven. The spindle construction includes double-row combination radial and thrust ball bearings at the forward end of the quill, with spindle piloted on the outside diameter of







F. F. GILMORE CO. 285 Columbus Ave. Boston 16 • Mass.

Boring, Testing.

Diamond-Boring, Turning, Facing, Engraving, Truing Tools, Styli, Gage Contacts. its six spindle driving end at the extreme back end of the unit. This arrangement is said to prevent the spindle from "whipping" and breaking tools under severe load.

0.

to

m

le

ed

or

be

n-

of

C-

n

a.l

i-

es

be

00

0-

ed

n-

w

th

of

The feed gears of the No. 5 can be easily changed by removing from splined shafts. A geared spindle reduction or Vbelt drive is available. A standard foot type N.E.M.A. frame size motor is used with the unit, which can be furnished with a direct connected or V-belt motor drive. A safety clutch which drives the camshaft is said to prevent damage to tools or spindle by kicking out under excess end thrust or friction load. The No. 5 unit is arranged for mounting in a dovetail adapter base which facilitates lining up and also provides screw adjustment back and forth in the base with a micrometer dial.

## "Colorflex-Plus" A.W.A. Color-Coat

Said to provide an ideal preservative and beautifying surface, indoors and out, to floors, walls, and ceilings, whether of masonry, cement, metal, wood, or composition, a synthetic resin penetrating color-coat designated as "Colorflex-Plus" A.W.A. is now being marketed by the Flexrock Co., Filbert & Cuthbert Sts., Philadelphia 4, Pennsylvania.

Highly resistant to the internal chemical action of cement when in the presence of moisture, the product, is is claimed, will not saponify and resists the alkali in soaps and cleaning compounds. Moreover, water, it is stated, will not cause the surface to soften, the finish remaining impervious to mineral oils and lubricants. Colors are said to remain fast under exposure to light, either natural or artificial. Penetration by dust and dirt is also claimed to be prevented by the color-coat, and the surface resulting from application is described as easy to clean and polish.

Designed for flowing on smoothly with a minimum of effort, Colorflex-Plus A.W.A. Color-Coat is available in red, gray, green, brown, and clear colors.

#### United States Universal Milling Attachment

Rugged construction, simplicity of design, versatility, and ease of installation on any small milling machine are features claimed for a universal milling attach-

MARK IRON, STEEL and CARBIDES



Echograph WAY

Original Electric Etcher. Thousands in Daily Use

Mark hardened parts, tools, dies, gages and fixtures of any ferrous metals including the hardest alloys and carbides—quickly—plainly. • Three sizes to meet all requirements.

· Write for circulars and prices.

#### BREWSTER-SQUIRES CO.

17 Washington St.

Tenafly, N. J.



Send blueprints or sample assemblies of your work for analysis. We will give quotations and recommend the proper HIGH SPEED Riveting Hammer to do the job right . . . and fast.

No obligation.



THE HIGH SPEED HAMMER COMPANY, INC. RIVETING HEADQUARTERS 307 NORTON ST. ROCHESTER S. N. Y. ment developed by The United States Machine Tool Co., 6 E. 72nd St., Cincinnati 16, Ohio. The attachment is equipped with two heavy duty steel driving gears and a large idler gear to accommodate the heaviest cuts within the capacity of the milling machine itself and yet operate silently. Both the cutter arbor and drive arbor are mounted on tapered Timken roller bearings, widely spaced for maximum support, and the idler gear is equipped with anti-friction bearings. The entire mechanism is tightly sealed and equipped with a single easily accessible grease nipple.

## GEM MACHINE VISES For TOOL-ROOM or Production.



Six sizes, 3" to 12". Many exclusive features. You see them everywhere. Write for circular.

J. E. MARTIN MACHINE WORKS
Springfield
Ohio

### Reduce Hand Finishing with

### WALTHAM Sub-Presses

Available in arch and overhanging types in 9 diameters 10 sizes up to 6".



Alignment is attained for precision and clean work.

Lower costs through savings in time and effort.

SEND SAMPLES OR DRAWINGS FOR ESTIMATE.

#### WALTHAM MACHINE WORKS

WALTHAM, MASSACHUSETTS

Arch Type Press MASSACHUSETTS Pinion & Gear Cutting Machine, Thread Milling Machine, Cylindrical Sub-Presses, Cutter Sharpening Machine, Small thread milling and gear cutters, Small special machinery.



United States Universal Milling Attachment

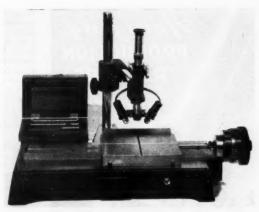
The United States Universal Milling Attachment is furnished with an arbor of the taper required for the milling machine with which it is to be used, and is driven by the milling machine spindle at the same speed as the spindle itself. Also included is an adapter plate with a stub overarm attached to it so that mounting of the attachment can be effected by merely placing the arbor and stub overarm into their respective positions on the milling machine. Equipped with a No. 7 B & S taper spindle, the attachment can be used for milling, drilling, or boring at any angle in any plane. A spring collet is available for adapting the attachment to a wide range of tools. The attachment complete with arbor, overarm, and adapter plate weighs 42 pounds.



#### Boeckeler Measuring Microscope

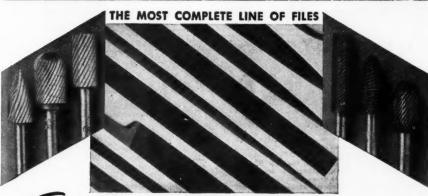
A measuring microscope for use in the mold shop and in the toolroom has been announced by the Boeckeler Instrument Co., 31 E. Rillito St., Tucson, Ariz. According to the manufacturer, the instrument needs no special care and is ruggedly and simply designed. Moreover, it is not easily injured and any injury can be economically repaired, the manufacturer

The design of the Boeckeler Measuring Microscope provides for a range of nominally 10 inches. Objects up to 7 inches high are accepted under the microscope objective. The micrometer head is provided with a scale on the barrel which can be tilted to correct any lead screw error. The instrument is built to ac-



commodate large and heavy workpieces for measurement and is said to be particularly useful in the measurement of dies and molds. Coordinate measurements are made by rotating the workpiece 90 degrees against a rail provided.

The instrument features 32X power



Grobet - THE OLDEST NAME IN FILES



r

b

7 at et nt

When precision and accuracy are required, GROBET, only, assures the finest workmanship, performance and durability BACKED BY OVER 136 YEARS OF LEADERSHIP IN THE INDUSTRY. Ask for GROBET by name at your nearest supply house—the most complete line of Swiss Precision Files, Rifflers, Rotary Files, Burs, American Pattern Files, etc., etc.

GROBET FILE CO. of AMERICA, Inc. 421 Canal Street, New York 13, N. Y.



is the ONLY Center with the

# OVERLOADINDICATOR

Look for the RED BAND

You no longer have to guess whether you are overloading your live center thrust bearings if you use MOTOR TOOL LIVE CENTERS. When the load is too great the RED BAND around the spindle disappears into the housing. You can see at a glance when overloading occurs. This is an exclusive feature, developed by Motor Tool which cuts repair costs to practically nothing if due diligence is exercised. As long as the RED BAND is visible you are running COOL and SAFE.

Send for

N E W descriptive folder . . . and verified
case histories of how MOTOR TOOL LIVE
CENTERS have out-performed and outlasted
ALL other centers on exceedingly tough,
continuous-run jobs.

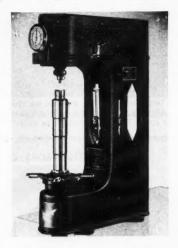


magnification and includes a stress relieved and pre-aged Meehanite base. Gage rods are hardened, ground, carbide tipped, and lapped to a tolerance of 0.000025 inch. The stage moves on precision ball bearings, and is provided with V-channels for the convenient measurement of screws, taps, diameters of small parts, and so on.

#### Clark Improved Hardness Tester

Now 65 to 85 lb. lighter due to the fact that the body is cast in aluminum, the improved hardness tester announced by

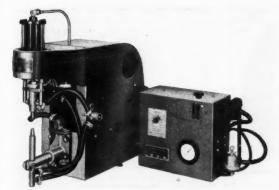
> pi ar cl: te th Tl



Clark Improved Hardness Tester

Clark Instrument, Inc., 10200 Ford Rd., Dearborn, Mich., can be used for the Rockwell testing of hard and soft steel, brass, aluminum, cast iron, copper, other metals, alloys, and plastics. Other outstanding features of the improved unit include a frictionless spindle which is said to assure a correct minor load; positive tripping for a more accurate major load; and an elevating screw fully enclosed for protection from dust, grit, and

The frictionless spindle is designed to overcome the spindle's natural tendency to be forced off the true vertical path when the minor load is applied. The improved tester is also said to overcome the danger of an incorrect major load, sometimes caused by friction or drag of the tripping lever on the loading beam. This hazard is eliminated by a zero drag trip-



Weldex Model 752-PB Bench Type Spot Welder

#### Weldex Model 752-PB Bench Type Spot Welder

For joining small metal parts, Weldex, Inc., Dept. K, 7327 McDonald Ave., Detroit 10, Mich., has introduced a fully automatic 7½ kva bench type spot welder. Designated as the Model 752-PB, the welder is precision-engineered to handle light non-ferrous metals of the same or dissim-

ilar alloy and thickness on a high speed production basis and to also provide for efficient, economical operation on ferrous metals up to two thicknesses of 14 gauge CRS or equivalent. High electrical efficiency is said to be assured through a quality transformer design coupled with a short secondary welding circuit.

In addition to an air strainer, regulator, gage, and lubricator, standard equipment

ping lever, on which tripping is positive and the weight always falls free, it is claimed. The elevating screw on the tester is enclosed from top to bottom, with the lower part serving as an oil reservoir. The lock screw that holds the telescope cover to the elevating screw can be easily loosened to permit lowering of the cover.

1

f

el,

t-

is

i-

or

n-

nd

to

th

n-

6-

he

p-

The Clark Improved Hardness Tester is available in three standard models, with 8, 12, or 16-inch vertical capacity.



of the Model 752-PB includes a built-in four-step transformer tap changing switch, single-acting air cylinder, magnetic long-life contactor, and electronic timer. Regularly furnished for 220-volt 60-cycle single-phase a.c. operation, the unit is also available for operation on 380 or 440 volts on special order. For maximum speed, control, and versatility, the following additional features are available as extras: positive double-acting air cylinder; two-stage toe-operated foot switch; adjustable platform type lower horn arrangement for mounting special welding fixtures of varying

THREAD ROLLING MACHINES

for precision metal forming

THREAD ROLLING DIES

for cylindrical & flat-die machines

KNURLS & THREAD ROLLS

for the serew machine industry

REED ROLLED THREAD DIE CO.

REED ROLLED THREAD DIE CO.

THREAD ROLLED THREAD DIE CO.

PROCESSER 2 MASS USA

heights; tube type contactors; special timing control equipment; and Vangtronic stored energy control panel.

tronic stored energy control panel.

The Weldex Model 752-PB Spot Welder has a standard throat depth of 4½ inches and, including the separate control cabinet, occupies less than two square feet of bench space.

10

ti

tl

a

he

SC

lin

I

fu

br

12 br

De

#### Faceweld Nos. 1 and 12 Hard Facing Electrodes

The Lincoln Electric Co., Cleveland 1, Ohio, has added to its hard facing line two tubular type shielded-arc electrodes designated as Faceweld No. 1 and Faceweld No. 12. Faceweld No. 1 deposits a chromium carbide type alloy surface and is used for hard facing parts of plain carbon, low alloy or manganese steel. It is designed to resist severe abrasion as well as moderate impact. Deposits of single layer are said to have a hardness of 40 to 52 Rockwell C and multiple layer beads, a hardness of 52 to 60 Rockwell C.

Faceweld No. 12 is an electrode of the same type as Faceweld No. 1 but is designed for use where the hard faced surface must withstand extremely severe abrasion as well as some impact. The deposit is harder but not as tough as that of Faceweld No. 1. Single layer deposits are said to have a hardness of 45 to 55 Rockwell C and multiple layer deposits are said to have a hardness of 55 to 64 Rockwell C.

The deposits of both Faceweld No. 1 and No. 12 are claimed to maintain high abrasion and hardness values at red heat, and their corrosion resistance is said to be comparable generally to that of stainless steel. The electrodes can be operated on either alternating or direct current, and are available in 14-inch lengths in  $\frac{\pi}{10}$  and  $\frac{\pi}{10}$ -inch diameter sizes, packed in 10-pound containers.

#### Producers of SCREW MACHINE PRODUCTS to specifications

We know our equipment.

Can we assist in designing your screw machine products for adaptation to our equipment?

Automatics—25%" Rd. capacity, Turret Lathes—3" Rd. capacity. Castings and Forgings machined to a maximum diameter of 10", length 8", weight 15 lbs.

We are also equipped for Milling, Drilling, Threading and Tapping. May we quote?

#### SCREW MACHINE SPECIALTY CO.

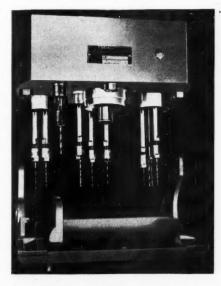
5637-43 Butler St.

STerling 2235

Pittsburgh 1, Pa.

#### Errington 10-Spindle Multiple Drilling Head

Errington Mechanical Laboratory, Inc., Staten Island 4, N. Y., announces a 10-spindle multiple drilling head for drilling 10 various size holes on different elevations. The head is equipped with grooved thrust ball bearings at all thrust points and hardened bronze radial bearings. The heat-treated spindles and gears of the



Errington 10-Spindle Multiple Drilling Head

head are each of one piece, turned from solid bar stock.

The Errington 10-Spindle Multiple Drilling Head is geared approximately 2 to 1, with all gears enclosed in a sand-cast aluminum case with Alemite pressure lubrication.

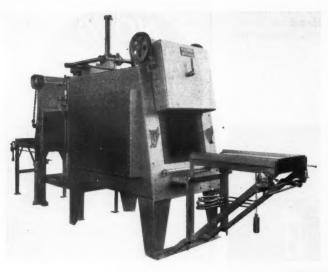
#### Lindberg All-Purpose Controlled Atmosphere Furnace

An all-purpose controlled atmosphere furnace suitable for hardening both high speed and air hardening steels has been brought out by the Lindberg Engineering Co., 2444 W. Hubbard St., Chicago 12, Ill. The furnace is also designed for brazing and sintering operations.

Heating is effected by Globar elements,



27 WARREN ST. NEW YORK 7,



Lindberg All-Purpose Controlled Atmosphere Furnace

tective atmosphere within the chamber and thus provide for unusually fast and uniform cooling. The protective atmosphere for both the heating chamber and the cooling chamber is provided by a generator of the proper type for the work involved. Both the charge and discharge doors of the furnace are operated by air cylinders.

with the furnace built to operate at temperatures up to 2,500 deg. F. A propeller type fan is built into the top part of the cooling chamber to circulate the pro-

#### "Metroscope"

Known as the "Metroscope," an ultrasonic device that is designed to automatically measure the wall thicknesses of

#### **Roll Forming Machines** and Roller Dies



Also Pittsburgh Lock Machines, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery-

Your inquiries invited.

Maplewood Machinery Co. 2636 Fullerton Ave., Chicago, Illinois

#### **KEYWAYS A Foot A Minute** With A MASTER CONVERTER



3 Sizes—For any Lathe 9" to 72" Capacity: 1 Cu. In. Metal Per Min. Per H.P.

BASIC MILLER and 7 Interchangeable HEADS THE MASTER LATHE CONVERTER The world's most versatile auxiliary machine tool.

Result of 14 years of designing, engineering and building multi-purpose milling and grinding attach-ments. Also does internal keyseating, drilling, reaming, boring, thread milling and hundreds of other metal working jobs. Maximum Performance, Minimum Cost. Write for Descriptive Literature.

MASTER MANUFACTURING CO. 1302 East Avenue "A" Hutchinson, Kan.

tee tel ke

me on

mi

AT

cal the tun are cy for

can par rea ma ind info par

inu gla test in g tive

S

metal, plastic, and glass parts where only one surface is accessible, as well as for making rapid non-destructive tests to detect flaws and imperfections in these materials, is now being produced by Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, California.

Particularly adaptable for use on rocket motors, aircraft propellers, and other such equipment, the device utilizes an electronic oscillator to generate electri-



"Metroscope"

cal voltage, the frequency of which is varied throughout the tuning range of the oscillator. The point or points in this tuning range at which the part resonates are indicated. Since the resonant-frequency and thickness of the part are related for any given material, the Metroscope can be calibrated to read thicknesses directly. The thicknesses of tubes and flat parts between 0.015 and 0.300 inch may be read directly and up to several inches may be read indirectly. The resonance indications also provide the operator with information regarding flaws in solid parts.

Steel, brass, nickel, copper, silver, aluminum, magnesium, and lead, as well as glass and plastic, may be measured and tested by the Metroscope, which is built in a single unit and housed in an attractive steel case.

**Fast Accurate** Measurements with



THE PERFECT TOOL

for machine shop, tool room, inspection control, aircraftmaintenance, etc.

External, internal and depth measurements all read simultaneously with a flick of the thumb on one vernier scale.
 "Open Window" type sliding jaw exposes scale completely and allows a

free reading.

Knife edged hardened jaws accommodate thread measurements.

Accurate measurements to .001".

Packed in a sturdy leather case.
Painstakingly machined, American made.

Size	Scale Graduations	Vernier Reading
6"	1/40" &	.001
	6"	Size Graduations 6" 1/40"

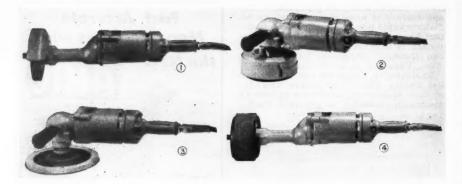
Also AMIC Precision Vernier Calipers, Height Gages, Depth Gages, Pocket Calipers, Precision Graduated Metal Scales.

Write for FREE Booklet C and price list or telephone PEnnsylvania 6-0687

Some exclusive territories available for manufacturers' agents and jobbers.

\*Registered Trade Mark.

AMERICAN MEASURING INSTRUMENTS CORP. 240 WEST 40th STREET NEW YORK 18, N.Y.



Rotor 360-Cycle Portable Abrasive Tools: (1) Straight Grinder with 6-Inch Straight Grinding Wheel, (2) Vertical Grinder with 6-Inch Cup Wheel, (3) Vertical Sander with 9-Inch Sanding Pad, and (4) Buffer with 6-Inch Buffing Wheel

#### Rotor 360-Cycle Portable Abrasive Tools

The Rotor Tool Co., Cleveland, Ohio, announces a complete line of 360-cycle portable abrasive tools, including small wheel grinders, cone grinders, 4, 6 and 8-inch straight grinders, 6-inch cup grind-

ers, 7 and 9-inch sanders, and 9-inch polishers.

The motor of each tool is a squirrel cage induction type in which the speed is governed by the frequency of the power supply, which is 360-cycle current (220 volts, 3 phase) supplied by an induction frequency converter or motor gen-



## "OLIVER" BRAZER

Recommended by 75 Band Saw Makers



ere said ligit special woo mice and but said special s

de:

AT

fro

thi

in

an

he

the

th

be

pre ted ted ste cas ne ing

na

an

du'

DO

lin

121

an

pol

we

Th

too

to

ma

h.p

we

Dec

7

The finest electric Band Saw Brazer made. In a few minutes this Brazer makes a perfect joint, as strong as the saw itself. It is equally efficient on metal and wood cutting saws. Temper is under full control at all times. Easy to operate, and safe, too—no danger of shocks or fire. The "Oliver" Electric Brazer is recommended by 75 makers of band saws, and by thousands of operators. Price, only \$60,00.

Write for Bulletin No. 462

OLIVER MACHINERY COMPANY GRAND RAPIDS 2, MICH. erator. The high frequency 360 cycles are said to produce unusual power in the light motor, which operates at a spindle speed of 21,600 r.p.m. For small wheel work, mounted points, or rotary files, the motor speed of 21,600 r.p.m. is used direct. For heavy operations such as 4, 6, and 8-inch wheel grinding or for sanding, buffing, or polishing, the motor speed is said to be geared down to the correct spindle speed.

According to the manufacturer, there are no electrical connections between the stator and rotor in any of the 360-cycle

tools, and the load speed, under severe load, is held to within 5 per cent of the free speed. Ample cooling is provided by a solid web fan which draws air from the rear through 12 cooling channels and expels the heated air from the front end of the tool. The bearings utilized are of a precision selected type, mounted in machined steel inserts cast into magnesium housings. The rotor is solid and dynamically balanced.

The heavy duty 4, 6, and 8-inch grinders in the 360-cycle portable tool line each weigh 121/2 lb., and the angle grinders, sanders, and polishers each weigh 1314 lb. The 360-cycle tools are said to provide a maximum of 1 h.p. for every 3 to 31/2 lb. of weight.

#### Automatic Loading Devices for Michigan Gear Finishers

A complete line of automatic loading devices for its gear finishing machines to suit different production requirements has been developed by the Michigan Tool Co., 7171 E. McNichols Rd., Detroit, Mich. Said to automatically reduce ide time per machine to two seconds per gear or less, the devices are designed for use on both rack and rotary type gear finishing machines and may also be applied to Michigan machines already in use. To



eliminate the use of arbors for the mounting of gears and pinions between centers, special pneumatic headstock centers are available in which the centers automatically act as arbors. Stripping of the work from the centers is also automatically effected.

The automatic loading devices are available in three major types: (1) gravity chute feed and unload type for small gears, (2) chute feed plus indexing mechanism with positive loading, and (3) jaw type loaders for large gears and cluster

gears. All of the loading devices are so designed as to provide electrical and me000

es

ha

es

al

ec

ge

111

or

Gravity Chute Feed Type Loading Device as Used on a Rotary Gear Finisher

chanical interlocks to interrupt the sequencing of the machine cycles in the event any parts of the mechanisms should fail to operate properly. Produc-

THOMPSON'S

OPEN-SIDE GRINDING WHEEL DRESSER



This Modern Wheel Dresser operates on a resilient bushing. It offers lower initial cost, sharper tools and a smooth shock-proof dressing action. Write for complete details. You should have one by each grinder.

THOMPSON MFG. CO. P.O. Box 627

tion rates as high as 300 pinions per hour per machines are said to be obtained with the loading devices.

#### U. S. Model HSHD7 Heavy Duty Sander

Identified as the Model HSHD7, a 7-inch high speed heavy duty sander for production or maintenance work is now being manufactured by The U. S. Electrical Tool Co., Cincinnati 14, Ohio. The unit is said to be amply powered for metal finishing, removing scale and rust with a wire brush, and smoothing welds and castings with a cup grinding wheel.

According to the manufacturer, streamline design with improved straight-line ventilation assures cool motor operation. The air outlet of the unit is arranged to divert dust-laden air away from the operator. The 3-in-1 flexible rubber pad utilized by the sander

## Use the RIGHT TOOL for the Job

The RIGHT TOOL for removing a broken tap is a WALTON TAP EXTRACTOR. This specialized tool has paid for itself time and time again, throughout the metal working industry, in both time saved and pieces salvaged. It will pay you to keep your crib stocked with a full set of Walton Extractors.

Learn about Waltons at our expense. Write for folder No. 10 and full details about our 30 Day Free Trial Offer.

THE WALTON COMPANY
HARTFORD 10, CONNECTICUT



adapts it to curved or flat surfaces. The ball type rear handle and thumb-operated switch provide for convenience and ease of operation. The reversible side handle can be used on either side of the 'ool to suit the operator,

The U. S. Model HSHD7 Sander is said



U. S. Model HSHD7 Heavy Duty Sander

to provide for excellent handling balance. The switch commutator and brushes of the tool are fully protected against abrasive dust and grit. Ball bearing equipped, with heat-treated alloy steel gears in a grease-tight case, the sander includes a spindle lock for use in changing discs. The universal motor of the unit is designed for operation on d.c. or a.c., 25 to 60 cycles, 110 volts. The

sander can also be equipped with a motor for operation on 220 or 250 volts.

The Model HSHD7 has a 5,000 r.p.m. no-load speed, overall length of 15% inches, and net weight of 12½ lb. The tool is supplied complete with a 7-inch rubber sanding pad, grit abrasive discs, spanner wrench, and 3-wire flexible rubber covered cable with indestructible rubber attachment plug.

#### Stonhard Resurfacer

Known as Stonhard Resurfacer, a maintenance material for repairing ruts and holes in industrial floors, traffic aisles, and driveways is now being marketed by the Stonhard Co., Dept. MMS, 1306 Spring Garden St., Philadelphia 23, Pa. According to the manufacturer, the material can be used to patch or overlay all types of floors, including cement, brick, asphalt, wood, and composition, and produces a smooth, durable, resilient, non-skid, sparkproof, and dampproof surface that withstands the heaviest trucking and, at the same time, assures a safe, comfortable footing.

Stonhard Resurfacer can be easily applied and is ready for use within 36 hours.

# BALDOR BALL BEARING GRINDERS

### **A Complete Line**

— 6" to 12" wheels —
BENCH and PEDESTAL TYPES

### Rugged---for heavy-duty service Precision-built for precision work

SHOWN HERE. BALDOR Grinder, Catalog No. 7120. Heavy-duty, ½ hp., ball-bearing, Capacitor Type motor; 60 cy., 3400 rpm., 7"x1" first grade Vitrified Bond wheels, 5%" arbor.

Large, adjustable tool rests ...... \$58.00

IMMEDIATE SHIPMENT - ALL SIZES

BALDOR ELECTRIC COMPANY
4380 Duncan Ave., St. Leuis 10, Mo.

ASK FOR BULLETIN 321-C ON COMPLETE LINE



d

#### Max-WELL-Made Improved E-Z Set Boring Tool

The Maxwell Co., 325 Broadway, Bedford, Ohio, announces that its MaxWELL-Made E-Z Set Boring Tool is now available with improvements which are said to increase tool efficiency and service life. Improvements include (1) the elimination of the gib in locking the tool block dovetail to assure faster action, more positive locking of the tool block, and permit wear adjustment; (2) hard chroming of all wear surfaces; and (3) flash chroming of all other tool parts to provide maximum protection against corrosion, thereby ensuring longer life.

The Model No. 30 boring tool shown



Max-WELL-Made Improved E-Z Set Boring Tool

in the accompanying illustration is compact and has maximum relative strength. It is smooth and circular in shape to provide for maximum safety of operation and to assure ease of handling. An unusual boring bar capacity is afforded by the three-position feature for the boring bar in the tool head. Rapid adjustment

is facilitated by well-spaced calibrations on the micrometer-type dial.

The Max-WELL-Made Improved E-Z Set Boring Tool is available in Models No. 30, 31, and 32 with maximum boring bar capacities of 1/2, 1, and 11/2 inches respectively. These models cover a boring range of from % to 20 inches and are supplied with boring bars and socket keys as standard equipment. They have interchangeable shanks and can be employed in jig borers, milling machines, boring mills, and so on.

STRIKES AROUND THE CLOCK

Airflex "Rotating Impact"

# takes Risk out of Riveting

Stop losses from bent rivets, imperfect heads, loose joints, broken or marred work pieces . . . install an Airflex Pneumatic Riveter.

Rotating peen distributes 4,000 to 6,000 straight-line hammer blows per minute "around the clock." Striking first at A, then at B, etc., each impact is limited to a small cross-sectional area of rivet. No more trouble with slender, unsupported, or hollow rivets . . . no risk riveting in glass, plastics, ceramics, etc. Twelve models, bench and floor types, standard and double end. Interchangeable hammer units. Send for Bulletin 74.

Immediate Engineering Service . . . Immediate Delivery

LEMERT ENGINEERING CO.

INTHE HOOSTER STATE SINCE 38"

TOOLS

1209 N. Western, Plymouth, Indiana

#### Sealant P.E. No. 1

Known as Sealant P.E. No. 1, a chemical sealant for use in the economical salvaging of rejected porous metal castings is now being marketed by the Western Sealant Co., 9093 W. Washington Blvd., Culver City, Calif. Designed primarily for the

ity

ma

of

cat

poe

bl

res

app

P.I

usi

sea

in

hy

litt

wh

of :

qui

wie

vac

inc

pre

int

2

impregnation and salvage of low density metals, such as aluminum and magnesium alloys, the sealant can also be applied with equal success to castings of bronze, steel, and gray iron. Its application is clean, and surfaces, ducts, pockets, or machined areas show no visible sign of the treatment, it is stated. In addition, it is claimed that no gummy residue is produced and subsequent coatings, such as anodizing or plating, can be applied before or after impregnation.

According to the manufacturer, Sealant P.E. No. 1 ensures pressure tightness usually with only one impregnation. The sealant, it is claimed, will not "bleed out" in curing and is chemically unaffected by hydrocarbons, other petroleum products, or glycols. Water, solvents, salts, and moderate acids or alkalis are said to have little or no effect on Sealant P.E. No. 1, which is stated to have a heat resistance of many times the normal operational requirements of the casting. The viscosity of the resin can be controlled to meet a wide range of requirements and ensure proper flow into all pores of the casting.

Small castings are impregnated by a vaccuum pressure method employing 29 inches of vaccuum and at least 100 p.s.i. pressure. Large castings are sealed by an internal pressure method. In either case,

the sealant is said to be forced into every pore in the casting. The part is then cured by dry heat.

#### "Molykote" Extreme-Pressure Lubricant

Known as "Molykote," an extremepressure dry lubricant consisting essentially of molybdenum disulfide powder and having the appearance of graphite although it contains none is now being marketed by The Alpha Corp., 1 Seneca Pl., Greenwich, Conn. With light rubbing, the lubricant is said to adhere tenaciously to even the smoothest surfaces. According to the manufacturer, the lubricant has an extremely low friction coefficient and an unusual capacity to prevent galling, seizing, or metal-to-metal contact at bearing pressures well over 100,000 p.s.i. and at either high or low sliding velocities. Ten ounces of the material are said to cover 500 square feet of smooth metal surface with a tenacious, shiny coating.

Useful as a factory-applied lifetime lubricant for mechanical articles. Molykote is claimed to be equally suitable for high, low, and room temperatures. When used on screw fasteners or press fits, assembly



is claimed to be effected at a smoothly increasing torque or force without jerking. Molykote is available in 10-ounce shakertype cans and may be mixed to a paste with S.A.E. 10 motor oil.

## Palmer-Shile Square Stacking

Manufacture of a square stacking box for handling miscellaneous parts is announced by the Palmer-Shile Co., 16022 Fullerton Ave., Detroit 27, Mich. The box

Accurate Hole Transfer Made Easy With NIELSEN TRANSFER SCREWS



Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 7 sizes U.S.S. Inexpensive

— Last for years. Write for Circular.

NIELSEN TOOL & DIE COMPANY 1960 W. Eleven Mile Rd. Berkley, Mich.



Palmer-Shile Square Stacking Box

is of all-steel welded construction with a four-way entrance and corrugated bottom. It is supported by four angle legs with shoes for floor protection.

According to the manufacturer, the square design permits stacking of the box in any desired manner. The box can be built in any size to meet requirements.

TOOL

ELK TOOL HOLDERS, Precision Built, eliminate bit vibrations. Universal-Straight, Right or Left Hand Positions. ONE will replace TEN single purpose Tool Holders.

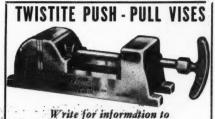
Write for Bulletin

ELK TOOLS, Inc. 71 W. Broadway

New York 7, N. Y.

#### Acme Roll Type Holder

The Acme Marking Equipment Co., 8030 Lyndon, Detroit 21, Mich., announces a roll type holder combining the advantages of roller dies and interchangeable inserts. Said to assure clear, sharp marking impressions due to a special method used for locking the type inserts in place, the holder is available in any desired size for use with marking machines or lathes. Rolling the impression on, one character at a time, is said to provide for a high degree of control and to result in a minimum of distortion of the material marked. Stress on the part and wear on



RICHARDS' INDUSTRIES INC. 24 Leonard St., N.W., Grand Rapids 5, Mich

300 MODERN MACHINE SHOP December, 1948

R 14 1 cou bein Cou cou atio

mer

bini

cha

the

min

Roll

men

is c of a spac

gen able of c

illus

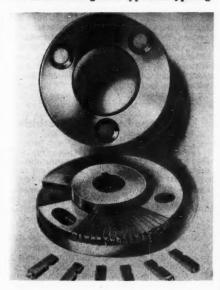
line

A

was pun Dece

the die are also said to be reduced to a minimum.

An outstanding feature of the Acme Roll Type Holder is a compensator segment with an elongated hole which, it is claimed, permits locking lines of type of any length and eliminates the need for spacers while preventing all play. Three general styles of the holder are available: Style D, providing for a single line of completely interchangeable type (as illustrated); Style E, providing a double line of interchangeable type and type seg-



Acme Roll Type Holder

ments; and Style F, a solid roll die combining permanent markings with interchangeable type and type segments.

#### Climax Type H Flexible Coupling

Recommended for all direct connected ¼ h.p. electric motor drives, a flexible coupling designated as the Type H is now being marketed by The Climax Flexible Coupling Co., 863 E. 140th St., Cleveland 10, Ohio. Of one-piece assembly, the coupling is claimed to provide quiet operation for such devices as oil burners, washing machines and ironers, small pumps, and air conditioning equipment.

for VERSATILITY, NEATNESS AND LONG-LIFE . . .

# HALL WELL

ready-made

# WORK BENCHES OF STEEL



The serviceable, ready-made "Hallowell" Work Benches of Steel are ideal equipment for modern shops. "Hallowell" Benches have smooth, long-wearing steel tops, are also available with heavy, highgrade laminated wood tops-or steel tops covered with "Tempered Presdwood. Made in 4 standard heights, 3 widths and 7 lengths, these "Hallowell" units can be used either individually or bolted together to form a continuous work bench-most any length—a money-saving feature not practicable with "nailed-together" wooden benches. The "Hallowell"—rigid as a rock-does not require costly bolting to the floor.

Write us for the name and address of your nearest "Hallowell" Industrial Distributor and your copy of the "Hallowell" Catalog.

QVER 45 YEARS IN BUSINESS

#### STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNSYLVANIA, BOX 556

Chicago • Detroit • Indianapelis
St. Louis • San Francisce

# STOP THAT DUST with DUSTKOP



MODEL 420 ILLUSTRATED

Keep machines and workers free of costly, abrasive dusts. Stop worker's complaints. The portable, self-contained DUSTKOP can be placed beside any machine and relocated later. Can usually be in operation 20 minutes after uncrating. Easily connected with metal hose or pipe. With a cyclone separator and spun glass filter, a direct-driven, self-clearing fan, DUSTKOP has the high suction capacity to give you TOP PERFORMANCE.

#### **CHECK THESE ADVANTAGES:**

□ DUCTLESS installation
 □ Operates only when needed
 □ Low maintenance
 □ Firesafe construction

Write for Catalog A-415 NOW AGET-DETROIT CO.

207 Main at Washington Ann Arbor, Michigan



Climax Type H Flexible Coupling

The Climax Type H Flexible Coupling is constructed of heavy duty rubber and fabric hose together with plated steel bodies. Socket set screws are furnished. The coupling is standardly available in lengths of 2½ to 4 inches and stock bores from ¼ to ½ inch. Couplings of extra length and larger bore sizes can be obtained on order.

whi

mot nati ed Cla

Spr ber spre to 1

A

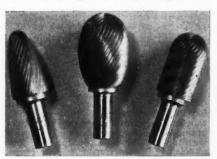
thu

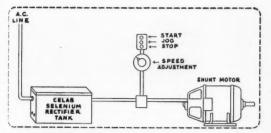
Severance Large Size Carbide Midget Mills

Severance Tool Industries Inc., 724 Iowa St., Saginaw, Mich., announces the addition to its line of carbide midget mills of three large size tools of the types shown herewith. Intended for operation at speeds of from 2,000 to 5,000 s.f.m., the mills are claimed to provide an efficient cutting action when used in either air or electric power tools.

Said to cut hard materials up to 63-C Rockwell, the Severance Large Size Carbide Midget Mills, in addition to use in freehand operations where the tools are applied to the work manually, can be chucked in machines and the work manipulated either manually or mechanically. When dull, the mills can be reground numerous times.

Severance Large Size Carbide Midget Mills





#### Celab Multi-Speed Electronic Motor Control

A multi-speed electronic motor control which is designed to drive direct current motors at adjustable speeds from alternating current lines is now being marketed under the trade name of Celab by Clark Electronic Laboratories, Palm Springs, Calif. With the unit, any number of speeds can be readily selected and spread over any desired ratio up to 20 to 1 for armature control.

According to the manufacturer, the Celab Motor Control does not require any special motor since the control does not use phase shift and the wave form is thus undistorted. Available in sizes from

Diagram Showing Setup Incorporating Celab Multi-Speed Electronic Motor Control

1 to 500 h.p. or larger, the control includes a contactor dial for selecting the speed desired, with the selenium units themselves changing the contact as well as rectifying the power. With the control, the line is never opened under power,

no part of the transformer is ever shorted, and arcing at contacts is eliminated even under a deliberate overload, the

manufacturer claims.

Intended for use in connection with machine tools, mobile transmissions, marine units, and so on, the Celab Multi-Speed Electronic Motor Control is of simple design, thus providing for easy installation and reducing maintenance to a minimum.

#### Grannan Lubricator

A lubricating valve which is said to deliver a positive metered amount of oil or grease to each bearing in lubricating



- \* At greater Man-Hour SAVINGS
- \* At higher rated EFFICIENCY
- \* At finer, effortless PRECISION

A Moline Multiple Spindle Specially Designed Machine Tool can do your job better at less cost. Ruggedly built to fit your INDIVIDUAL requirements in such operations as Boring—Straight Line Drilling—Universal Adjustable Spindle Drilling—Honing—Tapping—Reaming—Counterboring—Special Milling—these machines are based on years of experience accumulated since 1901.

based on years of experience accumulated since 1901.

For your SPECIAL problem of "Hole-Hog" and write us for any information you may

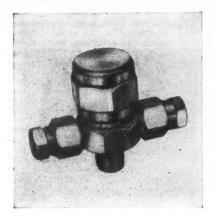
No. HU68 DRILLER





MOLINE TOOL COMPANY
100 20th Street Moline, Illinois

systems has been announced by Titeflex, Inc., 569 Frelinghuysen Ave., Newark 5, N. J. Known as the Grannan Lubricator,



Grannan Lubricator

the valve is designed to dispense all types of lubricants through the same outlet without alteration.

LEATHER • CANVAS • SHEEPSKIN • LEATHERETTE RUBBER



Die-cut leather pieces

Special shapes cut, sewed, glued, embossed, eyeletted, assembled to order. Samples and estimates furnished promptly.

NORTHLAND SALES & MFG. CO.

1445 N. 5th St.

Milwaukee 12, Wis.

A fully hydraulic through-flow valve with no pockets or crevices to retard lubrication, the Grannan Lubricator, according to the manufacturer, is completely enclosed to prevent leakage and to eliminate the possibility of contamination to the lubricant from outside sources. In use, the valve is installed directly into the bearing and does not require special guns in order to introduce lubricant to the system. The lubricator is said to function either with hand-operated guns or from a completely automatic system set to operate at any desired interval. The operating temperature range of the lubricator is from 0 to 300 deg. Fahrenheit.

Applications for the Grannan Lubricator include trucks, buses, road machinery, mining equipment, farm machinery, machine tools, and other production equipment. The valve is said to be capable of lubricating up to 500 bearings or more in less than one minute while the

machine is in operation.

#### Weldon Quick Change Holder

A quick change holder with Morse taper hole for use with the Weldon No. QA-50 quick change adapter is now being marketed by The Weldon Tool Co., 3000



Holds square, rectangular or round parts.

Jaws 5" across that open up to full 5" wide.

Horizental V-grooves for holding rounds up
to 2" in diameter. Built
in parallels for locating
flat or rectangular parts.

LAWRENCE H. COOK, INC.

65 MASSASOIT AVENUE
EAST PROVIDENCE 14, RHODE ISLAND

304 MODERN MACHINE SHOP

December, 1948

Dec

Woo

hold

tape

4 ta

T

rota cool dru

F., Nor

han

Lea

thro

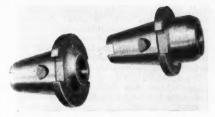
sure

stai

mat

of v

unic inat and fric the nee A cess



Weldon Quick Change Holders

Woodhill Rd., Cleveland 4, Ohio. The holder is made with a steep non-sticking taper on the outside and Morse No. 3 or 4 taper on the inside.

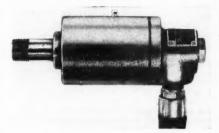
#### Deublin Union

The Deublin Union, a leakproof 3-in-1 rotating joint employed in heating or cooling revolving shafts, cylinders, or drums from minus 30 deg. F. to 300 deg. F., is announced by the Deublin Co., Northbrook, Ill. The union is said to handle steam, air, or liquids efficiently. Leakage is claimed to be prevented through use of a special Deub-Lock pressure seal and press fit assembly.

The Deublin Union is constructed of stainless steel, brass, and cast bronze materials to resist the corrosive action of vapors, gases, or liquids that may be used for heating or cooling. With the union, starting torque is practically eliminated, and the double-row ball bearings and precision assembly are said to reduce friction to a minimum. Lubrication is of the purge type and grease is held where needed by a system of pockets.

According to the manufacturer, any necessary maintenance can be performed quickly and easily in the user's shop due to the simplicity of assembly of the

#### Deublin Union



# NUMBERALL

#### IMPROVED TYPE HOLDERS

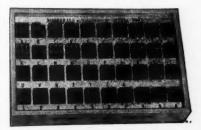
For Stamping into Metal, Etc.

Hand or Press style. Type can be easily, quickly loaded and unloaded. Simplest construction . . . Just a sturdy pin holds the type securely. No screws nor springs. Super-quality steel type made in various sizes: 1/32" up to 1/2" figures and letters.



#### TYPE AND TYPE BOX

Indexed Sectional Type Box with separate compartment for each character.
Two sizes for small and large type.



Type Box Bulletin on request.

NUMBERALL STAMP & TOOL CO.



#### LOOK FOR THESE MOTO - TOOL FEATURES

helped to set production records at General Electric, Westinghouse, Remington Arms, Ford, Nash-Kelvinator, Northrup,

Douglas and other plants.



SEE YOUR MILL SUPPLY DEALER. IF HE DOES NOT HANDLE MOTO-TOOL, WRITE THE FACTORY.

union. Both the union and cylinder or shaft to which it is attached may be easily "rodded out" without removing the union from the equipment. Double-row ball bearings and concentricity of threads in relation to the bearing surfaces are said to assure non-wobbling performance when properly installed.

The Deublin Union is available in two types which are interchangeable, the Monoflow for introduction of the cooling or heating medium into one side of the cylinder or shaft and the Duoflow for introducing and withdrawing the cooling or heating medium from the same side of the revolving cylinder or shaft. One type may be changed into the other without removing the union from the equipment on which it is installed. The union is available in four standard iron pipe sizes of ½, ¾, 1, and 1½ inches. Special sizes can be furnished on order.

#### "Traffic-Tred" Safety Floor Finish

To reduce industrial accidents caused by slips and falls resulting from hazardous footing, the Industrial Safety Products Division, The Watson-Standard Co., 225 Galveston Ave., Pittsburgh 30, Pa., is offering a safety floor finish to be known as "Traffic-Tred."

An abrasive floor coating which can be applied like paint, Traffic-Tred, according to the manufacturer, dries to a hard rough surface with texture similar to coarse sandpaper, and works equally well on steel, concrete, or wood, removing most of the danger from walking areas subject to dampness, greasiness, and other slippery conditions.

#### Zagar Standard Keyway Broaches

A set of standard tools for broaching keyways has been developed by Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 23, Ohio. The tools are designed for use on short stroke broaching machines in plants where many different sizes of holes are to be broached with different sizes of keyways on a production basis.

sizes of keyways on a production basis. With the broaches, keyways ½ inch wide x ¼ inch deep x 4 inches long can be produced on 20-inch stroke broaching machines and keyways up to 1 inch wide x ½ inch deep x 6 inches long on 36-inch stroke broaching machines. Through the use of a standard broach horn assembly developed by the company and combining

Zag

and be tool

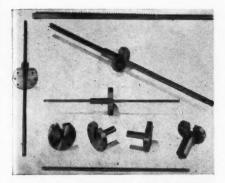
duty

Us Har

er.

Ad

D--



Zagar Standard Keyway Broaches and Broach Horn Assemblies

three separate parts (adapter plate, horn, and sleeve), tool inventories are said to be reduced to a definite few broaching tools.

#### "Monopak" Hydraulic Packing

"Monopak" is the name of a multipleduty hydraulic packing announced by the Hydraulic Accessories Co., Dept. 152,

429 E. Fort St., Detroit 26, Mich., which can be used for sealing various liquids and gases throughout an extremely wide range of temperature and pressure. Expressly developed to permit standardization for maintenance, the packing is recommended for manufacturers and users of hydraulic machine tools, presses, cylinders, hoists, elevators, struts, boosters, accumulators, welding guns, pumps, valves, compressors, turbines, earthmoving machinery, and agricultural implements.

Monopak, it is claimed, will seai against oil, water, brine, air, gases steam, weak acids, weak caustics, and refrigerants. It is said to withstand temperatures from minus 50 to plus 300 deg. F. and to resist pressures from zero to 3,000 pounds per square inch. The packing may be used for rods, packed pistons, or grooved pistons and is claimed to be effective on either reciprocating or rotating surfaces.

Each sealing element is composed of two staggered split rings, cushioned in a ring of resilient synthetic rubber. The split rings create a seal at the moving surface, but the cushion ring acts only as a housing seal and never touches this surface. The split rings are made from high grade anti-friction Babbitt, while

## For ACCURATE RADIUS GRINDING

Use this "K-O" Fixture

Handles cutters 15 "to 10" dia. Grinds convex or concave radius. 180° swing. Adaptable to any tool and cutter grinder. Mail coupon TODAY for complete details.



Aberdeen, South Dakota

K. O. LEE CO., 1114 First Ave. S. E.,

Please send us your illustrated bulletin on the "K-O" Radius Grinding Fixture.

Address

City\_

State

the cushion ring material is a specially developed Buna "N" compound.

In operation, the fluid pressure automatically reacts upon the cushion ring, forcing the split rings into tighter contact with the moving part. When the pressure subsides, this thrust is reduced and all unnecessary friction is said to be eliminated.

Monopak is packaged in individual sets, stamped according to inside diameter, outside diameter, and length. It may be obtained in any size from ½ inch inside diameter to 36 inches outside diameter. Easy to install, the packing needs

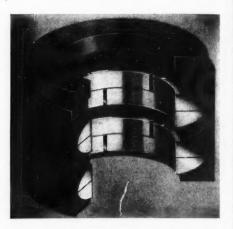


4 TYPE—2 lengths of spindle extension; 2 types of air control valves, one for continual operation and one for intermittent work. Steel body for safety. No lubrication required. Abundance of power. Lightweight 12 ounces. Whole length 5½", length of body 3". Accommodates mounted grinding wheels, rotary files, etc. on ½" dia. shanks. Speed such as to operate Tungsten Carbide burrs, rotary files, etc. to their full efficiency.

\*Representatives In Principal Cities\*



130-134 E. LARNED ST. DETROIT 26, MICHIGAN



T

Dre

wh

ava

inc

a 4

Cro

diri

ass

free

the

lear

cla

"Monopak" Hydraulic Packing

no special adapters, requires little attention, and is built to last indefinitely, the manufacturer states. An extremely low coefficient of friction is said to ensure long life not only for the packing but also for the major elements of the machine in which it is used.

## Crown "Tru-Dress" Grinding Wheel Dresser

The Crown Industrial Products Co., 1521 E. 53rd St., Chicago 15, Ill., has announced a grinding wheel dresser, to be known as the "Tru-Dress," which is claimed to assure accurate grinding by removing irregularities in the wheel and improving the cutting action. Due to the fact that the emery wheel in the dresser turns fully on its bearings, the dresser is said to provide for good balancing of the wheel being dressed.

#### For Your Convenience ...

the "Where to Get It" section of MODERN MACHINE SHOP, originated in February, 1940, provides a quick reference to machinery, tools and supplies advertised in the current issue. Use it consistently. You'll find it's very helpful. (See pages 344, 345 and 346.)

MODERN MACHINE SHOP

The Crown Tru-Dress Grinding Wheel Dresser, which may also be used to shape wheels for grinding special contours, is available in two sizes, one having a 3inch diameter emery wheel and the other a 4-inch wheel. In the smaller unit, the emery wheel is mounted on hardened



Crown "Tru-Dress" Grinding Wheel Dresser

steel bearings which are protected from dirt and abrasive. Provision is made for lubrication. On the larger Tru-Dress, the emery wheel is mounted on precision sealed ball bearings which are said to assure high accuracy and long troublefree service. A portion of the handle on the 4-inch Tru-Dress may be removed, leaving a straight shank suitable for clamping in a cylindrical grinder.

Replacement cutting wheels are available for both sizes of the dresser. The replacement wheel can be readily installed by the user when necessary.

## Acromarker Interchangeable Die

To facilitate quick changing of letter and number sizes, The Acromark Co., 9 Morrell St., Elizabeth 4, N. J., has developed an interchangeable die head which is adaptable to use in practically any stamping press of suitable size. Sizes of dies range from 18-inch characters to %-inch Gothic Style, with the die head containing all the letters of the alphabet, common punctuation marks, and a full set of figures.

The head is 6% inches in diameter not including the dies which extend % inch. The thickness of the wheel is % inch and the length of the steel shaft is 1% inches. The die wheel is mounted on a doublerow precision ball bearing, and the shaft has a flat on side for locking in straight position. A blanked bright metal pointer designates the positioning of the character being stamped, and the die wheel turns freely, locking in position by a

## DRILLING WITH THE Speed-Right?

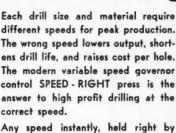






THE ELECTRO-MECHANO CO. 261 EAST ERIE STREET Milwaukee 2, Wisconsin

Write for Bulletin 307



Any speed instantly, held right by governor at Min. to Max. load. 1000-10,000 or 2500-15,000 RPM. Cap. .004-.156".

Investigate the SPEED-RIGHT sensitive single, multiple and air-feed press today, PRICED FROM \$136.50. Immediate delivery . . . .



Engineering Service without obligation

DO IT RIGHT WITH

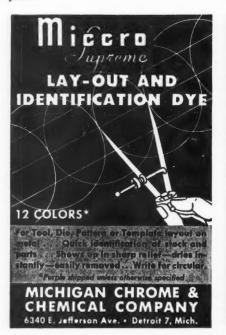
Speed-Right



Acromarker Interchangeable Die Head

spring bar pin on the back. The shaft diameter is  $\frac{5}{8}$  inch.

The dial is of cast bronze with bright face characters indicating the position of each stamping character. The mounting plate is of gray iron, precision turned to hold the dies at the base. Screws through the mounting plate and the faceplate provide for locking of the dies firmly in place.



#### "Three-M-ite" Resin Bond Cloth Belt

inc

he in

Ch

equ

me

ha

nis

Du

cui

the

cir

F

att

spe

ann

ing

tro

ma del

tec

be

chi

pin

to

ing

Dec

Designed with a resin bond to provide extra durability and heat resistance, an abrasive cloth belt designated as the "Three-M-ite" is announced by the Minnesota Mining & Manufacturing Co., St. Paul 6, Minn. The belt consists of aluminum oxide mineral grains, in grits from 24 to 120, coated on a flexible cloth backing with a resinoid bond.

Available in widths up to 18 inches and in lengths from 60 inches up, the Three-M-ite Resin Bond Cloth Belt is said to be particularly useful for stock removal operations involving sharp contours, high belt speeds, or frictional heat.

#### Kwick-Change Heavy Duty Multiple Adjustable Drill Head

A multiple adjustable drill head for heavy duty has been added to the line of Kwick-Change drill heads offered by Strutz & Mead, Inc., 1227 N. Water St., Milwaukee 2, Wis. The head is made in two to eight-spindle models. Bolt circles vary from 2% to 14% inches in the two-spindle model drill head to 7% to 20%.



inches in the eight-spindle model drill head.

Designed to drill holes up to 1½ inches in diameter in cast iron, the Kwick-Change Heavy Duty Drill Head is equipped with No. 3 Morse taper spindles having a 1-inch vertical drill adjustment. The head is of anti-friction bearing construction throughout and all gears are of S.A.E. 4615 steel, carburized and hardened.

One set of positioning templates is furnished with the Kwick-Change Heavy Duty Drill Head. All templates are accurately jig bored. Since each spindle of



Kwick-Change Heavy Duty Multiple Adjustable Drill Head

the head rotates around two centers, an infinite variety of hole patterns and bolt circles can be obtained.

#### "Jay-Dee" Tapping Attachment

Known as the "Jay-Dee," a tapping attachment which is said to be designed specifically to eliminate tap breakage is announced by the Wickman Manufacturing Co., 15533 Woodrow Wilson Ave., Detroit 3, Mich. By means of a resilient material, the attachment is claimed to deliver a safe cutting torque and protect taps regardless of load.

The Jay-Dee Tapping Attachment can be used with all types of reversible machines for the horizontal or vertical tapping of blind or through holes. It is said to be particularly suited for stud driving and for standard hand taps. Four



These Tapping Tips of Woody's are not intended as any technical advise on tapping. They're just random thoughts, hints and short cuts Woody has gathered in his years around the shops. He is passing them on in the hope that they will help smooth out some routine job so it will go easier and faster.

For the specific problems that frequently come up, consult our engineers. Send in complete data on the job—material, depth, diameter, lubricant, whether the hole is through or blind. Our engineers will be glad to make recommendations without obligation.

Note—Woody Spencer's Tapping Tips will appear here as regularly as "Woody" gets time to write them up.

LOOK FOR THEM.

THE RIGHT TAP AT THE RIGHT TIME

The Wood & Spencer Company Reveland 3. Ohio

index stations, listed according to tap size on the body of the attachment, can be quickly selected and provide positive settings for a wide variety of materials. Tap changing is said to require 5 seconds, with no wrenches necessary. Tap adapters supplied for various size taps are inserted in the master collet of the attachment and held in place by spring buttons. The only maintenance that is said to be required is lubricant rechanging at three-month intervals.

The Jay-Dee is available in three models, each with a Morse taper shank. The Model K-1, which is 161/2 inches long and



"Jay-Dee" Tapping Attachment

weighs 161/2 lb., has a 1/2 to 11/4-inch U.S.S. range. The Model K-2, which is 13% inches long and weighs 11 lb., has a % to 1%-inch U.S.S. range. The Model K-3, which is 10 inches long and weighs 31/2 lb., has a 16 to 1/2-inch U.S.S. range.

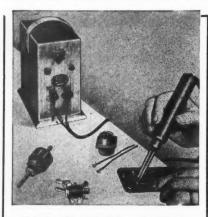
#### ADVANCE CLAMPS

Cut Set-Up Time 75% on

JIGBORERS

THE ONLY T-SLOT CLAMP For use on all machines with T-slots. Manufactured and sold by

ADVANCE MACHINE WORKS PORT WAYNE 7, INDIANA



#### FOR FASTER, SAFER SOLDERING

The Luma resistance method of soldering is the accepted way for small shops requiring single operation to large plants with many types of operations. Write for complete information about this remarkable tool.

LUMA ELECTRIC EQUIPMENT CO. . O. Box 132-M.S. Teledo 1, Ohlo

#### Northwest Metal Cleaner SC-9

Said to readily remove oils and tallow based drawing compounds, a combination alkali-emulsion cleaner for pressure washing equipment is announced by the Northwest Chemical Co., 9310 Roselawn Ave., Detroit 4, Mich. A petroleum derivative contained in the cleaner, which is designated as Northwest Metal Cleaner SC-9, aids in controlling foam and the formation of rust.

According to the manufacturer, the cleaner is particularly adapted to general washing machine use prior to Bonderizing and painting and as a precleaner prior to plating. The material is supplied in non-returnable steel drums and kegs.

#### Porter-Cable D-6 Multi-Purpose Tool

Designated as the D-6, a powerful multi-purpose tool which can be adapted to grinding, polishing, drilling, and cut-

#### ...for more than 1001 jobs

 The Hjorth Lathe has the speed, accuracy, handling ease and dependability that appeals to every operator. That's why you'll find the better shops equipping with the Hjorth Lathe.

HJORTH LATHE & TOOL CO. 8 BEACON STREET WOBURN, MASS.

December, 1948

char

noul

Co.,

The

1/4 1

equi

for 1

as h

whe

carb

thro

ferre

able

ed. 1 debu

polis

may

the ! W

Cabl

ferre tica.

has

dian

is p

thru

ing,

tach or r

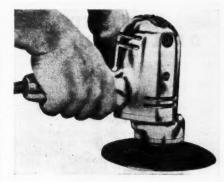
A

ting-off operations by the simple interchange of attachments has been announced by the Porter-Cable Machine Co., 1714 N. Salina St., Syracuse 8, N. Y. The tool is designed to drill a hole up to inch in diameter in metal, and is equipped with a chuck which can be used for numerous standard attachments such as hole saws, wire brushes, cup grinding wheels, abrasive points, and so on.

A stiff 7-inch disc infused with silicon carbide grit can be used edgewise to cut through steel and other ferrous and nonferrous metals. By attaching other suitable discs to the D-6, welds can be blended, large surfaces ground down, castings deburred, and brass and other metals polished. By attaching a buff, surfaces may be polished to a high luster with

the tool.

Weighing less than 6 lb., the Porter-Cable D-6 Tool can be quickly transferred to any job and used overhead, vertically, and in cramped areas. The tool has a %-inch shaft and utilizes a 6-inch diameter grinding disc. A special bearing is provided to accommodate heavy end thrusts under pressure of sanding, grinding, or drilling. A guide grip can be attached to either side of the tool for left or right-handed operators.



Porter-Cable D-6 Multi-Purpose Tool

Specifications of the D-6 are as follows: motor, universal 115-volt 25-60 cycle single-phase d.c.-a.c. type; spindle, %-inch 11-thread with 14-inch hex socket in end; speed (approximately), 3,000 r.p.m. no load and 2,000 r.p.m. normal load; overall dimensions, 7% inches high x 7% inches wide x 11% inches long; and net weight, 5 lb. 13 ounces.



#### ALMOND CHUCKS



Maximum Gripping Power with Extreme Accuracy and Long Life.

Write for Catalog.

T. R. Almond Mfg. Co. Ashburnham, Mass. U. S. A.

#### Monarch Precision SHAPLANE Radius Tools



Four Models for

LATHES, SHAPERS, PLANERS, **BORING MILLS** 

RANGE 1/2" To 3" RADIUS (MODEL ALSO AVAILABLE FOR CONVEX CUTTING)

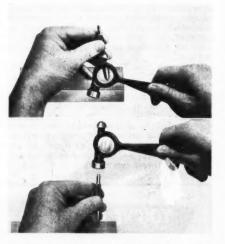
C. B. TEETER

**Tool Room Specialties** 

4470 Oakenwald Ave., Chicago 15, III. Phone Drexel 3571

#### Starrett Tool and Die Makers' Hammer

The accurate spotting and punching of center lines and intersections is said to be simplified by the use of the Starrett Tool and Die Makers' Hammer shown herewith, product of The L. S. Starrett Co., Athol, Mass. A 7-power lens built into the head of the hammer enables a punch to be precisely spotted and accurately struck without once removing the eyes from the work, it is claimed.



Starrett Tool and Die Makers' Hammer in Use

The hammer is made from a steel forging with flat and ball peen ends on the head, and weighs 4 oz. The head is offset to permit use in corners or close to obstructions.

#### Dallett "Holedrill" Pneumatic Drill

The Dallett "Holedrill," a self-rotating lightweight pneumatic drill which is designed to permit one-hand operation, high speed drilling in all types of masonry and stone, is announced by The Dallett Co., Mascher at Lippincott St., Philadelphia 33, Pa. The tool is precision made from selected alloys, hardened and ground to ensure maximum strength combined with light, balanced weight. The handle of the drill is made of aluminum.

Hol desi the Said tica the ped A 1 Stvl sha size incl cial C 8. 1 with tool

"B" star to 1

Sp

the dri Dril lows high spe r.p.r incl tain es 1 er: pour

Val

Th

Valv Free pur desi volin fact uct a g can time

Decer



Dallett "Holedrill" Pneumatic Drill

An outstanding feature of the Dallett Holedrill is a safety retainer which is

designed to prevent accidental release of the drill in the tool. Said to have practically no recoil, the unit is equipped with a No. 11-A toolholder for Style "A" taper shank star drills, sizes 1/4 to 3/4 inch inclusive. On special order, the unit can be equipped with a No. 11-B toolholder for Style "B" taper shank star drills, sizes 1/8 to 11/2 inches.

Specifications of the Dallett Holedrill Pneumatic Drill are as follows: capacity (at high speed), ½ to ½ - inch drills; speed, 1,800-2,000 r.p.m.; length, 16 inches with retainer and 13 inches without retainer; and weight, 9½ pounds.

#### Valvoline "X-5" Grease

The Freedom-Valvoline Oil Co., Freedom, Pa., announces a multipurpose grease designated as Valvoline "X-5." In factories, the product can be used as a general lubricant, minimizing time between ap-

lications, grease consumption, and errors, it is claimed.

According to the manufacturer, Valvoline X-5 Multi-Purpose Grease changes very little in body up to a temperature of 400 deg. F. due to its special metallic soap base; does not combine with water; and is water resistant.

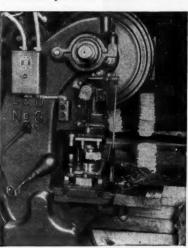
#### Production Circular Form Tool Blanks

The Production Service Co., 1060 Broad St., Newark 2, N. J., is now offering a complete line of circular form tool blanks to be used for circular tools on all types

## Lots of little things make L & J PRESSES BETTER!

F OR instance, the method by which the bearing load is conveyed to the frame on both the up and down strokes. Bearing caps remain tight, as the studs are not loaded when pulling dies out of a drawn piece of work.

Check every detail of an L & J Press and you'll find lots of little things and big things too - that assure a longer service life. lower maintenance costs and a better product - things learned in nearly a half century of working with press users-things that make L & J Press first choice of so many companies. Send for catalog.



Dependable L & J Sales Engineers at Your Service



826 Ren Street

Elkhart, Ind

# SCHERR aids to precision — production

Two instruments for measuring cutting and wheel speeds



#### SCHERR Hand TACHOMETER

Measures rpm without timing or calculation while held against end of rotating shaft. Any variation in speed caused by belt slipping, overload, etc., is instantly noted. Also have disc for measuring surface speeds in feet per min. Made for speeds from 30 to 12,000 changing speed range by new

ingspeed range by new rotating shift mechanism. Price, \$67.50. Other types to 48,000 rpm. Write for details.



#### SPEED INDICATOR

Gives direct readings in rpm in a test requiring only 6 seconds. Needle remains at reading until released by pressure of button. Also measures linear speeds using disc attachment. Two types, ranges to 20,000 rpm. Price, \$37.50.

## Measure gear pitch quickly SCHERR



Any diametrical pitch, from 3 to 64, obtained instantly without counting teeth, measuring gear diameter, or other computation. Used like

GEAR GAGE SET

a thread gage. Teeth are cut in stainless steel segments by Fellows gear generating method, on true arc. Here is something the gear-using world has long needed. Complete set, \$12.50. In ordering, specify 14½ deg. or 20 deg. P.A.

Write for details on these and other Scherr tools.

GEO. SCHERR CO., Inc.

of automatic screw machines. The blanks are made from a standard brand of 18-4-1 high speed steel and can be furnished soft or in a hardened condition, having

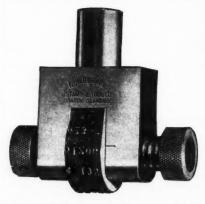


Production Circular Form Tool Blank

a 64-65 Rockwell "C" hardness. Both left and right-hand threaded tool blanks are available.

#### Numberall Model No. 82 Numbering Head

Designated as the Model No. 82, a numbering head for use in all stamping operations requiring quick selective number-



Numberall Model No. 82 Numbering Head

ing is now being offered by the Numberall Stamp & Tool Co., Huguenot Park, Staten Island 12, N. Y. The numbering

po

wh

fig

set

ing the wh

ing

Let a t

plie

wit

45,

foo

to

and

cut

Sou

nev

ins

tion

wheels are engraved with direct sight figures at the front of the head and are set to the required character by turning two knurled knobs. By pushing the knobs right or left, any one of the

wheels may be engaged.

The Numberall Model No. 82 Numbering Head is custom built and may be obtained with  $\frac{1}{10}$  to  $\frac{1}{4}$ -inch size figures. Letter wheels with up to 11 letters and a blank on each wheel can also be supplied. The head can be furnished in sizes with from 1 to 12 wheels and can be used in Numberall Platforms Nos. 95, 98, 45, 46, and 47, respectively; in power and foot presses; or in the Numberall No. 97 bench toggle press.

#### AO Head-Rest Safety Goggle

A head-rest safety goggle which is said to offer unusual comfort, convenience, and protection for gas welders, burners, cutters, brazers, and furnace men is announced by the American Optical Co., Southbridge, Mass. Based on an entirely new spring mechanism, the goggle can be instantly thrown into "off-guard" position by a mere flick of the wrist. The goggle is accurately balanced and, because



AO Head-Rest Safety Goggle

of the spring mechanism, there is no overhanging weight even when the goggle is in the "off-guard" position.

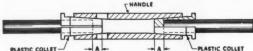
Adjustment to facial contours and correct pupillary distances can be made instantaneously and, once the adjustment is made for any face, no readjust-



using these power units. Send for complete catalog

## LeMaire Tool & Mfg. Co. 2657 5. Telegraph Road

Designers and builders of unit and way, type machines for single or multiple spindle drilling, boring, reaming, resping, etc.—Twin Rom Hydroulic Units—Match-II Gear Chucks.



Cross-Sectional Drawing of "Plast-O-Lock" Plug Gage

drill

use: ing bein Indi

stee

fron

ned

Twe

size with

M

D

fran

Co.,

leve

the

tens

chai snu han

mec

is th dire

posi

aut

of i

of d and

to g

spec witl

able

Dece

T

ment is necessary, regardless of how often the goggle is used. The Duraweld Coverglas goggle included with the unit is said to protect eyes against injurious light radiations, glare, flying sparks, and scale. It may be worn directly over the eyes or personal prescription glasses. The fiber headgear is designed to fit comfortably and can be adjusted to any head size by a nut turning on a right and left-hand threaded stud. A genuine leather sweatband provides additional comfort.

"Plast-O-Lock" Plug Gage

Durable lightweight plastic is utilized in the collet-held plug gage now being manufactured under the trade name of "Plast-O-Lock" by Turner Brothers, Inc., 2625 Hilton Rd., Ferndale 20, Mich. The "go" and "no go" gage members are held in opposite ends of the gage handle by means of self-locking plastic collets

which are each made a solid base (A) that stops the gage member when it is being fitted into the collet and prevents the gage from slipping through the collet into the handle. Thus, the gage, plus the collet, can be fitted into the handle firmly. The self-locking device grips the gage and prevents it from sticking in the hole being gaged, it is claimed. The collets of the Plast-O-Lock" Plug

Gage are black and red respectively to signify "go" and "no go." This use of color is said to materially increase the speed of handling the gage. The handle itself is a rich deep blue aluminum. The gage is available in a range of diameters

from 0.050 to 0.690 inch.

#### Ragle Tip Drill Kit

Approximately the size of an automatic pencil and designed with a pocket clip so that it can be carried in the pocket much in the same manner as a pencil, a tip





**Ball & Roller Bearings** 

Select the bearings you need from the diversified line shown in our latest catalog. Profusely illustrated, and complete with explanatory text and tables, you will find the Gwilliam Catalog an invaluable aid when ordering. Representative stocks of all the various types are maintained for prompt shipment.

"Serving Industry For 36 Years"

THE GWILLIAM COMPANY

358 Furman St. Brooklyn 2, N.Y.

MODERN MACHINE SHOP

December, 1948

drill kit utilizing carbon steel drills for use in the quick cleaning and reconditioning of practically any welding tip is now being manufactured by the J. M. Ragle Industries, Kansas City, Missouri.

At one end of the tool is a tempered



os g ts

e, ie

ı.

g

0

f

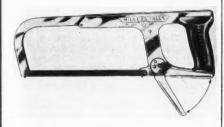
e

Ragle Tip Drill Kit

steel double-end chuck for holding drills from sizes 45 to 80. The handle is designed to hold 24 different sizes of drills. Twelve assorted drills in even number sizes from 52 to 74 inclusive are supplied with the kit.

### Millers Falls No. 300 Hack Saw Frame

Designated as the No. 300, a hack saw frame introduced by the Millers Falls Co., Greenfield, Mass., features a unique lever action which is said to provide for the application of maximum and uniform tension on blades and allow for fast blade changes. When the powerful lever, which snugly hugs the bottom of the frame handle, is pulled down, a foolproof cam mechanism releases tension. The blade is then inserted facing in any one of four directions, the lever is snapped back into



Millers Falls Hack Saw Frame

position, and positive, correct tension is automatically applied on the blade.

The rigid, heavy duty frame is made of  $\frac{1}{18}$  x  $\frac{3}{4}$ -inch steel. The handle consists of durable red plastic molded in one piece, and is said to be extremely comfortable to grip. A Millers Falls "Tuf-Flex (R)" special alloy flexible blade is supplied with the frame, which is quickly adjustable for either 10 or 12-inch blades.



# ETTCO-EMRICK High-Speed, Sensitive ATTACHMENTS

Ettco-Emrick Tapping Attachments fit into the drill press spindle just like any shank tool. Their design and construction assures all the true-running sensitivity needed for clean, accurate threads.

When fitted with acorn or button-type die-holders and dies, Ettco Tappers become fast, accurate threading units capable of maintaining high production rates at lowest cost.

WRITE FOR BULLETIN 22 for full details and prices.

## ETTCO TOOL CO.

598 Johnson Ave., Brooklyn 6, N. Y.

Boston, Massachusetts • Portland, Connecticut
Detroit, Michigan • Chicago, Illinois

### Scherr 20-Degree Pressure Angle Gear Gage

Previously available only with a 14½-deg. pressure angle, the stainless steel gear gage\*manufactured by the George Scherr Co., Inc., 198-A Lafayette St., New York 12, N. Y., is now being produced with 20 deg. pressure angle full length tooth forms 3-4-5-6-8-10-12-16-20-24-32-48 and stub tooth forms ¾-4/5-5/7-6/8-8/10 - 10/12 - 12/14-16/21-20/26-24/32-32/42-48/64.

According to the manufacturer, the

Universal

Tool Block

Scherr 20-Degree Pressure Angle Gear Gage in Use

Ohr

I

rat

fac

lon

sign

age

slot

wit

TIN No

wil

car

gre

for

Replaces tool post and nine standard tool holders. Rigidly supports turning, boring, threading, and cutoff tool bits. Rotatable. Has self-aligning knurling head Precision adjustment for tool height. No re-adjust.

height. No re-adjustment required when replacing tools. Adaptable to some other lathes. Write ior dimension sheet.

SOUTH BEND LATHE WORKS

gage is intended for the quick checking of gears, eliminating tedious calculation and computation to determine the pitch of a gear with unknown pitch. By merely rolling the gage over the tooth of a gear, as shown in the accompanying illustration, the operator is able to instantly determine the pitch without chance of error, it is claimed.

### Ohmer Type 82-A Single Control Register

Identified as the Type 82-A, a single control register for industrial use is now being produced by the Ohmer Corp., Box 998, Dayton, Ohio. The register includes a double set of figures. The upper set of figures (% inch high) is designed to record a count up to 999. This total may be returned to zero at any time—at the end of a shift, a run, or the completion of a count. The lower set of figures (% inch high) is arranged to provide a grand total and is accumulative up to 99,999, at which point the figures automatically turn over to zero.

The Ohmer Type 82-A Single Control



### with MAJESTIC DRILL SHARPENER

Now you can always have perfectly sharpened, fast-cutting drills that really take the proper bits and cut smoothly without chatter. Simply turn the Autometic Dial Control, and the Majestic Drill Sharpener is set to grind both cutting edges and both angles exactly alike. Takes any size drill from 5/32" to 1", straight or No. 2 taper shank. Fits any grinder. Adjustable for hard or soft materials. The Majestic Drill Sharpener is a real production tool that assures longer drill life, speeds up the work and quickly soves its cost in factories, garages and repair shops. Price \$10.75 F.O.B. Factory, ask your supply house, or order direct. Many thousands in use. Circular on request.

Dealers, Jobbers: Write for Information.

## MAJESTIC DRILL SHARPENER CO.

1337 S. 6th St.,

Minneapolis 4, Minn.

### MUMMERT-DIXON SWING FRAME GRINDERS



Sizes 12", 14", 16", 18", 20" and 24" wheels.

Ask for Descriptive Circular

M U M M E R T - D I X O N C O .

120 Philadelphia St. Hanaver, Pa.



Ohmer Type 82-A Single Control Register

ng

on

ch ely

ar,

a-

le-

or.

le w

οx es

of 6-

be nd

a ch al

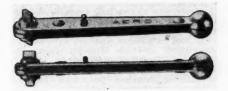
at lу

ol

Register is operated by a lever located at the right which may be moved by hand or actuated by any suitable mechanism with a reciprocating motion. If desired, the counter can be fitted with a bell to ring at each operation.

Phillips, and other screws for assembly operations.

According to the manufacturer, the ratchet of the screw driver permits the use of the tool in confined spaces, and the reversing lever makes the tool suitable for driving or removing screws. The screw driver has two blades, one for large and one for small screws, and in-



Aero No. 5200 Offset Ratchet Screw Drivers

cludes a ball end grip to prevent injury to the hand. The overall length of the tool is 3% inches.

Mention MODERN MACHINE SHOP when writing to advertisers.

#### Aero No. 5200 Offset Ratchet Screw Driver

Identified as the No. 5200, an offset ratchet screw driver now being manufactured by the Aero Tool Co., 6930 Avalon Blvd., Los Angeles 3, Calif., is designed to permit the application of leverage to drive screws and to also permit access to hard-to-get-at areas. Made for slotted screws only, the tool is available with special drivers for Reed & Prince,



## INSTANTLY **ADJUSTABLE** WORK HOLDER CLAMP

**Patents Pending** 

#### FOR USE ON:

Milling Machines, Power and Hand Punch Presses, Drill Presses, Planers, Boring Mills, Grinders, Shapers, Jig Borers, Lathe Face Plates, Jigs and Fixtures.

TIME-SAVING, Compact, Pays for itself the very first time it is used. No more searching for shims and blocking materials. Clamp will instantly level to ANY HEIGHT desired. No other clamp can outperform this new tested product. Holds the work with great pressure, a practical marvel in simplicity and usefulness for any plant or shop.

By inserting one or both pins in the round disc holes, different clamping heights are instantly obtained to suit the work to be clamped. Send for Literature.

Price \$4.80 F.O.B. Essex, Conn. Distributors for this exclusive product wanted in all States.

Available in the 3½" diameter Disc Size with 7½" long Clamp-ing Arm. Adjustable from 0 to 2½". By using blocks under the round disc, any elemaine being

round disc, any clamping height

may be obtained, still retaining the fine instant adjustment desired.

BOX 113, THE AMERICAN PRODUCTS COMPANY, ESSEX, CONN.

### New Books

Process Engineering. By William H. Schutt. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. 309 pages. 58 figures, 18 charts. Cloth binding, board covers. Price, \$4.00.

Designed to train any reader who is thoroughly familiar with time and motion study and can read blueprints to become a process engineer, this book shows how to determine the selling price or directlabor cost of an article to be manufactured, and explains how to make accurate cost estimates and set up efficient production methods directly from the blueprint. Detailed information is presented on estimating labor costs and on visualizing manual processes for all kinds of machining operations, such as shearing, sawing, punching, drilling, polishing, and so on.

Moreover, the book shows the reader how to use formulas for speeds and feeds of power presses and other machines. It also explains how to select the proper material for economical production; presents formulas for bending and channeling; and indicates how to estimate the size of blanks for forming various products. The book offers the reader point-by-point guidance in the en-

tire procedure of cost estimating, including easy-to-follow demonstrations involving every kind of work on power presses, lathes, drills, and so on.

tabl

shil

ren

Dia

wit

met

this

dia

ed

Me

nur

ica

wit

can

me

bor

fur

and

bee

in

div

ing

bro

ent

ref

ent

bet

De

I

A

The Metric System of Weights and Measures. Published by Bureau of Publications, Teachers College, Columbia University, 525 W. 120th St., New York 27, N. Y. 304 pages. Cloth binding, board covers. Price, \$3.00.

Prepared by a committee of the National Council of Teachers of Mathematics, this book is the twentieth in the series of Yearbooks started in 1926 by the Council and supplies a comprehensive view of metric usage at the present time as reported by some 60 individual and numerous organized groups active in widely varied fields and by the American press. It surveys the history, nature, and advantages of the metric system and offers specific programs for its adoption both in general use and in the classroom throughout the United States and the British Empire which alone in the civilized world have not yet made this change to integrated and uniform weights and measures.

The book is described as a very important addition to the volumes that preceded it and will serve as a companion work to the Nineteenth Yearbook which deals with surveying instruments. Special emphasis is placed on the value of the metric system in all activities involved.

ing measurement.

Diamond Tool Patents II—Diamond Abrasive Wheels. Edited by P. Grodzinski. Published by Industrial Diamond Information Bureau, Industrial Distributors (Sales) Ltd., 32-34 Holborn Viaduct,

London, E.C. 1, England. 52 pages, 2

### MAKE WASHERS AND SHIMS

Up to 1/8" Thickness
IN STEEL—PLASTIC—MICA—RUBBER, ETC.



This handy shim and washer die set pierces the thinnest of shim stock or up to 1/16" through mild steel, without burring. Funch sizes are 3/16" to 1" in 1/16" or %" graduations. 28 washer combinations. Made of high grade tool steel hardened and drawn to withstandshock without breakage. \$39.50 per set. Write for complete specifications. Finished Wooden Case \$4.75 extra. Distributors Wanted

DAVIS & LARRICK MFG. CO. Box 191, Route No. 2, Dayton 10, Ohio



tables, appendix, name index. Price, 10 shillings (approximately \$2.00 U. S. currency).

V-

28,

nd

li-

ıi-

27.

V-

n-

S.

of

eil

of

e-

r-

ly

8.

1-

rs

n

1-

h

d

0

d

About three years ago the Industrial Diamond Information Bureau issued a survery of international patents, dealing with the machining of metals and nonmetallic substances. As a companion to this previous compilation, a survey on diamond abrasive wheels has been worked out by Mr. P. Grodzinski assisted by Messrs. D. L. C. Jackson and W. Jacobsohn. This brochure lists and classifies in numerical order about 400 British, American, German, and other patents dealing with this subject matter.

In general, all bonded diamond wheels can be sub-divided into three classes: metallic bond, resinoid bond, and vitrified bond. The resinoid bonded wheels can be further sub-divided into thermosetting and thermoplastic. A special table has been compiled in which the types of bond in diamond abrasive wheels are sub-divided and which quotes the corresponding patent numbers. The main part of the brochure contains abstracts of these patents in numerical order, in which it is referred to the main features of the patents. The length of the abstracts varies between 50 to 100 words. Data on particu-

lar compositions are usually quoted in full. An appendix is added on patents dealing with the production and use of loose diamond abrasive.

Professional Registration Laws and the Engineer. By A. M. Sargent. Published by A. M. Sargent, 19669 John R St., Detroit 3, Mich. 60 pages. Heavy paper covers. Prices: single copy, 75 cents; 10 copies, \$6.75; 50 copies, \$30.00; 100 copies, \$52.50; 1,000 copies, \$450.00.

An examination of the history and facts behind professional registration for engineers, this booklet is intended to objectively examine the public necessity for such laws, to call attention to the effects strict enforcement would have upon the industry and society in general, to discuss the general requirements of the laws, and to point out some of the potentially dangerous practices open to administrative officials who are granted broad and vaguely-defined powers.

The author is a registered professional engineer, a past president of the American Society of Tool Engineers, a doctor of engineering, and president and general manager of the Pioneer Engineering and Manufacturing Company. He has studied

## LARGE CAPACITY

# LESLIE MODEL A HAND PUNCH PRESS

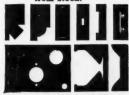
Reduce costs, eliminate die changes... stay permanently set up by handling short run punching operations on a Leslie Model A Press—the low cost, large capacity (2" hole in 12 ga. mild) press with accuracy to .0001". Patented aligning leaf maintains positive die alignment without leader pins, slides or ways.

6" throat.

Standard Punch Plate—4" x 4%".

Bed 6" x 10" with hole 3\%" x 4\%".

Standard Punches and Dies available from stock.



untalland distriction and relations

Illustration at right indicates versatility of the Leslie Press...each blanking done with one stroke.

\$120.00

Write for complete information.

Dealer inquiries invited.

արդակարո

the subject at close range for many years.

The contents of the booklet are headed as follows: How Registration Began; Licensing of Other Professions; Can Professional Status Be Attained by Legislation?; Illinois Court Attacks Vital Point of Registration Laws; What Is Engineering? and Who Is An Engineer?; Engineers Who Is a Professional Engineer?; Engineers Who Should Not Be Licensed; Exemptions; Licensing and Collective Bargaining; How Licensing Can Affect Individual Engineers; Registration As It Affects Engineering Firms; Examination and Experience Requirements; Administration of Registration Laws; and Conclusion.

Bibliography on Industrial Radiology, 1945-1948. By Herbert R. Isenburger. Published by St. John X-Ray Laboratory, Califon, N. J. Price, \$2.00.

This addends to "Industrial Radiology" has been published with the purpose of bringing the bibliography up to date. The first part, up to 1942, appeared in St. John K-Ray Laboratory's book on "Industrial Radiology" published by John Wiley & Sons, New York, in 1943 and the first

supplement, 1942-1945, was published by the Laboratory in 1945. The second supplement, 1945-1948, contains over 300 references. atio

bre

boo

a c

in seri

and

of c

ing

app

slid

cha

tro

des

ing

C

W.

net

ette

the

the

is

off

ing

pro dar elir

the

Ter

eni

fec

Ter Ha Ha Ha Tri ing He ing

Ha

to tair Car

on

Dra

Ste

Re

Bla

Ha

Ro

ing

W

Ha

Dec

as Ste

T

Machine Design. By Paul H. Black. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New Yor 18, N. Y. 357 pages. Illustrated. Cloth binding, board covers. Price, \$4.00.

This book is intended to serve as a textbook for courses in general machine design and as a reference book in mechanical-design offices. The student has been kept constantly in mind and an effort has been made to include discussions of approaches, assumptions, explanations, and special considerations and applications.

The material covers design methods of applying strength and deflection considerations, selection of materials, machine elements as fastenings, springs and translation screws, and methods for designing and selecting power-transmission units and their components. Whenever possible, the rational approach has been used to replace the empirical approach. The American Standards Associ-





**Blind Hole Bottoming** 

Many enthusiastic users report that the Behr Boring Bar actually pays for itself in the first four weeks of operation. Just ask the man who uses one.

This new patented bar is chatter proof, extremely accurate and ultra efficient. Has interchangeable blades and accessories.

It is unequalled for versatility and efficiency.



Can you afford not to get the facts? WRITE FOR CATALOG TODAY

BEHR PRODUCTS COMPANY

## USE ECONOMY

Headless Set Screws Socket Set Screws





Try Them On Your Next Job!

## ECONOMY MACHINE PRODUCTS COMPANY

5212 Lawrence Ave., Chicago 30, Ill.

ation nomenclature, symbols, and abbreviations are employed throughout the

The book provides, among other things, a consideration of stress concentration in machine members, its applicability, seriousness, mitigation, determination, and design application; logical methods of determining allowable stresses, including the effect of surface finish: a design approach to gear problems; chapters on surface finish friction and wear and on sliding bearings and lubrication; and a chapter on vibration and vibration control presenting theory and methods for designing and selecting vibration-absorbing units.

Common Sense in Steel Treating. By W. R. Bennett. Published by W. R. Bennett, Brattleboro, Vt. 86 pages. Leather-

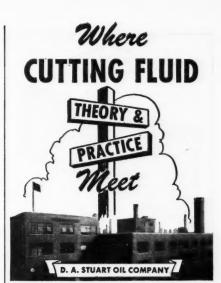
e

ette covers. Price, \$2.00.

The purpose of this book is to solve the difficulties constantly cropping up in the daily life of the man whose duty it is to harden steel. The book does not offer a preponderance of subjects, having no direct bearing on present difficulties. It does, however, deal with specific problems causing trouble, points out the dangerous steps, and advises methods to eliminate them entirely, thus preventing their recurrence.

The contents of the books are divided as follows: Know Your Steel; Sparking Steel to Determine Types; Annealing; Temperature Control; Heating for Hardening; Quenching Carbon Tool Steel; Effect of Cooling Carbon Steel from High Temperatures; Pre-Heating All Steels; Hardening Carbon Steel Milling Cutters; Hardening Carbon Steel Seller's Hobs; Hardening Carbon Steel Blanking and Trimming Dies; Hardening Fancy Striking Dies for Brass, Silver and Steel; Heating Hot Forge Drop Dies; Quenching Hot Forge Drop Dies; Relation of Hardness of Carbon Steel with Reference to Size; Quenching Carbon Steel to Attain Intermediate Hardness; Shrinking Carbon Steel Drawing Dies; Soft Spots on Working Surface of Carbon Steel Drawing Dies; Over Heating Carbon Tool Steel; Marking the Shanks of Taps and Reamers; Hardening Carbon Steel Shear Blades; Heating Carbon Steel Rolls for Hardening; Quenching Carbon Steel Rolls; Using Common Sense in Quenching Carbon Steel Rolls.

Vibration Transmission in Quenching; Why Advocate Withdrawing Tool Steel Hot from the Quench?: File Testing for Hardness; Why Quench Tool Steel on a

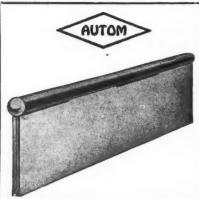


SELDOM does the most carefully developed scientific theory provide the final answer in the shop; neither is practical experience entirely dependable. It usually takes a combination of both in order to select and apply the cutting fluid that will give the best results on a given machining job.

D. A. Stuart Oil Company offers you a combination of theory and practical experience that pays dividends in better machining and fewer production headaches. The theory emanates from research in the modern D. A. Stuart laboratories; practical approach comes from men who have years of experience in shop problems and techniques. That is why Stuart products so often smooth out jobs on which other cutting fluids fail. Ask your D. A. Stuart Oil Co. representative to tackle your tough jobs.

STUART service goes with every barrel

2741 1/2 South Troy St., Chicago 23, Illinois



## **CONTINUOUS HINGES**

Manufactured by

## AUTO MOULDING & MFG. CO.

WRITE FOR STOCK LIST

1114 E. 87TH ST.

CHICAGO 19

## "SKELTON" TAPER REAMERS



The Roughing Reamer with two cutting edges ground radial on a taper to correspond with hole to be reamed. Two opposite edges are "backed off" to govern chip thickness. This "safety edge" prevents "hogging in" or "chattering." A special feature permits straight, centralized holes, even though turret is out of line with spindle. Write for catalog 103 describing this reamer and the Helical Finisher also



Finisher

Morse, B & S and SAE Tapers in stock. Specials to order.

shown.

**Dealer Territories Available** 

ONONDAGA TOOL CORP.

Rising Heat?; Why Does Steel Shorten or Lengthen as a Result of Hardening?; Non-Changeable Oil Hardening Manganese Steels; Soft Exteriors Experienced with Oil Hardening Manganese Steels; An Interesting Experiment with an Oil Hardening Manganese Die: Quenching Baths: Comparative Calorific Value of Kerosene and Fuel Oil; Relative Heat Value of Fuel Oil and Gas; Advisability of Annealing Forgings; The Recalescence and Decalescence Points; High Speed Steel; Annealing High Speed Steel; Pre-Heating High Speed Steel; Heating High Speed Steel for Hardening; Atmospheric Control; Determining Atmosphere of a Oven; Determining Correct Furnace Temperatures by Aid of a Hardness Tester; Proof of Correct Hardening Temperatures for High Speed Steel; High Speed Cooling Rate; The Lead Bath for Quenching High Speed Steel; Salt Baths for Heating Tool Steel and Quenching High Speed Steel; Hardening High Speed

g8

ad

pr

Si

19

sis

2 8

Gi

co

W

ve

st

ha

ar

th

in

th

av

th

ch

se

wi

ics

To

re

B

Ta

Steel Screw Slotting Saws. Maintaining Soft Shanks on Small High Speed Taps, Reamers and Counterbores; To Prevent Particles of Floor Brick Adhering to High Speed Tools; High Speed Heat Determination Without Pyrometer Aids; Straightening H S Taps, Reamers and Broaches from Hot Quenching Bath; The Advisability of the Draw Back; Quenching High Speed Steel in Oil; Grinding High Speed Tools; Pack Hardening High Speed Steel; The Long Draw; High Carbon-High Chrome Steel; Pack Hardening High Carbon-High Chrome Steel; Cause and Prevention of Decarburized, Carburized Pieces; Hardening Carbon Steel Hollow Threading Dies; Carbon Steel Ground Stock; Wet Nitriding; Tungsten Carbide; Keeping the Tickets with the Work; Low Carbon Steel Blanking Dies; Spring Tempering on a Line: Straightening Hardened Stay Bolt Taps and Reamers; Roll Threading Dies; Splined Shafts; Carbon Steel Step Shafts; "The Man at the Fire"; and Re-

Shafts; "The capitulation.

American Standards for Machine Tool Elements. The American Standard on Spindle Noses for Tool Room Lathes, Engine Lathes, Turret Lathes and Automatic Lathes, B5.9-1948, is a revision of the 1936 edition and includes 39 full page tables giving complete dimensions and tolerances for all sizes of Types A, B, D, and L spindle noses. These tables also provide dimensions of the backs of mating chucks and faceplates and dimensions of working gages and inspection

gages to maintain interchangeability. In addition, the new edition of the standard provides specifications for additional sizes of spindles of types given in the 1936 edition. These include two smaller sizes of Types A, B, and D spindles (the 2 and 3-inch) and one larger size of Types A and B spindles (the 28-inch).

d

il

of

t

y

9

d

h

C

et

3-

1-

h

r

g

d

ıt

S

t

el k

g

h

g

g

ygp

n

3,

f

e

d

0

American Standard for Taps, Cut and Ground Thread, B5.4-1948, takes into account the new styles and sizes of taps which have been adopted in the nine years since the previous edition of this standard appeared and omits those which have become obsolete. Although changes are still taking place in the standards for screw threads, particularly because of the activity of A.S.A. committees working on an American-British agreement, this edition has been issued to make available the large number of changes that have already taken place during the last few years. The largest number of changes are in the pipe taps where dryseal taps appear for the first time along with a new 16-inch size.

Copies of these two standards, American Standard on Spindle Noses for Tool Room Lathes, Engine Lathes, Turret Lathes and Automatic Lathes, E5.9-1948, and American Standard for Taps, Cut and Ground Thread, B5.4-1948,

are available from the American Standards Association, 70 E. 45th St., New York 17, N. Y., the former at 85 cents percopy and the latter at \$1.50 per copy.

Aluminum Alloys and Mill Products. To meet the demand for factual information on aluminum alloys and mill products, the Reynolds Metals Company has prepared a handy pocket-size 162-page book, complete with 163 tables of data on alloys, tempers, sizes, shapes, physical properties, chemical properties, mechanical properties, and fabricating characteristics, plus 33 pages of explanatory text covering a wide range of related subjects such as the alloy designation system, the temper designation system, heat-treatable and non-heat-treatable alloys, casting alloys, casting methods, and foundry practice.

In addition, wrought aluminum mill products and methods of producing them are described. Fabricating methods discussed include blanking, drawing, stretch forming, spinning, embossing, coining, stamping, bending, machining, forging, welding, brazing, soldering, and riveting. A section on surface finishes for aluminum is also included, covering mechani-

## ENCO LATHE TURRETS ARE SAVING PRODUCTION \$ \$ \$ \$ EVERY DAY. ARE YOU SAVING YOUR SHARE?



MODEL NO. 650 BED TURRET TOOLED UP ON A 16" LATHE.

CHECK THESE FEATURES

FOR ALL LATHES FROM 9" TO 17" SWING

- All Bearing Surfaces Ground and Hand
- Spotted
   All Parts of Indexing Mechanism Hardened
- Hexagon Head Spring Loaded
- Full Bearing Slide, No Chip Interference
- · Seasoned Castings

- Twin Gear Drive for Repetitive Accuracy
- Dovetail Double Gib Construction Adjustable Front and Rear
- Pilot Wheel for Sensitive Control
- Turret Base Clears Lathe Saddle Wings
- · External Vise Grip Clamping

Also Mfgrs. of Enco Turret Tool Posts For All Lathes.

ENCO MANUFACTURING COMPANY

4524 W. FULLERTON AVE., CHICAGO 39, ILLINOIS



## A FINER\* CENTER

\*Not recommended for Semi-Precision Work held to less than .0001 in.

Sizes from No. 1 to No. 9 Morse Taper Shank. Capacity from 250 lbs. to 6,000 lbs.

Standard Stock Delivery. Special 10 Day Delivery.

\$42 to \$197.50
AGENTS WANTED

## MONTGOMERY

**Machine Tool Accessories** 

**53 PARK PLACE** 

N. Y. C. 7, N. Y.



Detroit 7, U.S. A.

cal finishes, chemical finishes, electrolytic oxide finishes, electroplated finishes, and organic finishes. In another section, aluminum pig and ingot products are described and their production explained. A discussion of the physical, chemical, and mechanical properties of aluminum is also provided in the book, along with definitions of terms used.

The handy wire-bound 6 x 9-inch book is available without charge to engineers, designers, and technical men addressing requests on their company letterheads to the Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky. To all others, the

price is \$1.00 per copy.

Quizzes on Management Skill. The American Management Association has published two quizzes by which supervisors, foremen, and higher executives can test their knowledge of management principles. One quiz, entitled "What's Your Management I.Q.?", is designed to enable executives, supervisors, and foremen to appraise their knowledge of managerial principles and their ability to train the lead workers. Compiled by Ellis H. Woolley, training supervisor, Naval Supply Depot, Oakland, Calif., the quiz tests for knowledge of principles of organization, basic literature of management, methods of training, and physchology of leadership. Its questions range from "Who wrote 'The Theory of the Leisure Class'?" to "Should you give employees fond of horseplay more responsibility, send them home, or buy them a horse?"

The second quiz, a much longer test entitled "Self-Analysis Quiz for Supervisors and Executives," provides a means whereby higher-level supervisors, executives, and those who aspire to such positions can score themselves on knowledge of executive work. Its questions range from marking true or false such statements as "The only way to overcome laziness of a worker is to discipline him severely," to selecting the best method for handling problems involving subjects from employee relations to organizational structure. This quiz was prepared by Rexford Hersey, associate professor of industry. University of Pennsylvania.

dustry, University of Pennsylvania.

Copies of the quiz "What's Your Management I.Q.?" are available at a price of 20 cents each, while copies of the other quiz, "Self-Analysis Quiz for Supervisors and Executives," can be obtained at a price of 25 cents each from the American Management Association, 330 W. 42nd St., New York 18, New York.

Sei ment 8. Il folde tiple inclu spine drive upor

> ford bull Co., desc equi cart clea engi ing clea mag mer shir slot sum mer

> > tin

661

147 Jos. Campau

## New Shop Literature

ro-

h-

ec-

ets

X-

al,

of

k,

ok

rs,

ng

to

rd

ne

28

ıt

S

0

1-

n [.

f

Seibert Multiple Spindle Drilling Equipment. Seibert & Sons, Inc., East Peorla 8. Ill., is now distributing a four-page folder illustrating and describing its multiple spindle drilling equipment, which includes standard slip and bracket type spindles, arms, brackets, adapters, lower drives, and pinion drive shafts. Copy free upon request.

"132 Unusual Uses for Spencer-Hartford Vacuum" is the title of a 20-page bulletin issued by The Spencer Turbine Co., Hartford 6, Conn., illustrating and describing the use of vacuum cleaning equipment for bench cleaning; removing carbon dust from brass molds; chucks; cleaning electrical equipment; cleaning engines; removing welding fumes; cleaning heat treating furnaces while hot; cleaning electric furnaces; collecting magnesium chips; cleaning radio equipment and instruments before testing and shipping; research work; sand blasting; slot cleaning; reclaiming solder; cleaning sump tanks; tin plate cleaning; and numerous other operations. Copy of Bulletin No. 144 free upon request.

Buckeye Bearings and Maintenance Bars. The Buckeye Brass & Mfg. Co., 6410 Hawthorne Ave., Cleveland 3, Ohio, has published a 44-page pocket-size catalog which presents a progressive size listing of the company's complete line of bronze sleeve type bearings and maintenance bars. The catalog also presents a numerical listing of standard stock bearings, as well as illustrated and descriptive information on the oil grooving, drilling, and graphiting of these bearings. In addition, the catalog contains a separate numerical price list of the bronze sleeve type bearings.

Copy of Catalog No. 480 is available to individuals addressing requests on their

company letterheads.

"Turner System of Materials Handling." A 28-page booklet describing and illustrating the various units which comprise the physical equipment of the Turner System of Materials Handling has been prepared by the Factory Service Co., 4615 N. 21st St., Milwaukee, Wis. Also presented is a series of illustrations showing these units actually in use in a number of large industrial plants. Copy free upon



- 1. Machine stopping and starting
- 2. Removing and replacing work on the chuck or table
- 3. Lowering and raising wheel head
- 4. Wheel and diamond accidents
- 5. Locating diamond for dressing

### FOR SURFACE AND CYLINDRICAL GRINDERS

 Dresser Compensated for Wear

• Easily Attached

Sent on 10-DAY APPROVAL at No Cost to Youl BUILT BY TOOL AND DIE MAKERS

Mfrs. Complete Line of Precision Vises--Dressers

MATCO TOOL CO. 2830-36 West Lake Street

Chicago 12, Illinois

Premier Panels, Dials, and Plates. A four-page two-color folder released by the Premier Metal Etching Co., 21-09 44th Ave., Long Island City 1, N. Y., illustrates how some of America's largest companies have employed the Premier Metal firm to provide maximum utility name plates. Halftones of actual photoings, close tolerance calibrations, and accurately positioned holes and lettering of

and sales value to their panels, dials, and graphs show the sharply defined markthe etched and lithographed metal work. Copy of folder free upon request.

Acme Optical Flats with Holes for checking ring seals in assembly and for checking integral shoulder seals provide the subject of a bulletin now being distributed by the Acme Scientific Co., 1450 W. Randolph St., Chicago 7, Ill. Copy of Bulletin 464 free upon request.

Ha

Oper

page

Brot

are t

as W

on h

cross

comp

and

free

"T

Blan

page publ 64 S

is ir

surf then

tity

The

into

char

Blar

Blar

vice

Blar

on t

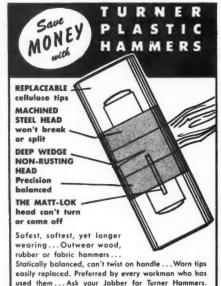
Dec

Co

Grant Speed Reducers. The Grant Gear Works, Inc., 162 W. Second St., South Boston 27, Mass., now has available a catalog which illustrates and describes a complete line of speed reducers which provides for seven gear arrangements and hundreds of ratios. Copy free.

H&G General Purpose Self-Opening Die Heads with Hobbed Chasers are featured in an eight-page two-color bulletin published by The Eastern Machine Screw Corp., Truman & Barclay Sts., New Haven 6, Conn. The bulletin fully covers the features, dimensions, and applications of the die heads which are available in styles for automatics, turret lathes, hand screw machines, hand turret lathes, and other machines. Copy of Bulletin 5 free upon request.

Drill Rods and Cold Drawn Specialty Steels. The Pittsburgh Tool Steel Wire Co., Monaca, Pa., now has available a 48-page pocket-size catalog containing complete descriptive information on carbon, alloy, and high speed drill rods, as well as other cold drawn carbon, alloy, and high speed steels, including special shapes. Presented are general recommendations for the heat treatment of the various grades, as well as helpful definitions and suggested uses for drill rods and cold finished fine steels. Copy of Catalog No. 5 free upon request.



MATTICKS MANUFACTURING CO. 4156 E. PACIFIC WAY . L. A. 23, CALIF.



COMBINATION OUTSIDE and INSIDE TUBE DEBURRING FILES

From ½" to 2¼" O.D. in 16 sizes. High speed steel ground from the solid after hardening. Makes 45° chamfer outside, 30° inside. Adjustable to increase or decrease relative chamfer between inside and outside wall of tubing. Speed ranges from 50 to 250 r.p.m. according to size. Also sold in sets in special wooden box. Write for technical details and Catalog BTI.

Order from your favorite supply house.

AMERICA CO. o f GROBET FILE NEW YORK 13, N. Y. **421 CANAL STREET** 

December, 1948

Hardinge High Speed Precision Second Operation Machine is featured in a 20-page bulletin released by Hardinge Brothers, Inc., Elmira, N. Y. Included are tooling dimensions and a floor plan, as well as illustrated and descriptive data on headstock spindle tooling, double tool cross slide tooling, shank turret tooling, compound slide rest, end-working slide, and accessories. Copy of Bulletin DSM59 free upon request.

for

for

de

150

ar

th

a

a

ch

nd

rie of

n

"The Art of Surface Grinding with the Blanchard Grinder" is the title of a 48-page pocket size plastic-bound booklet published by The Blanchard Machine Co., 64 State St., Cambridge 39, Mass., which is intended for operators of Blanchard surface grinders and is designed to assist them in attaining high quality and quantity performance from their equipment. The contents of the booklet are divided into four principal parts as follows: Blanchard Grinding; Grinding Wheels for Blanchard Grinders; and Blanchard Service.

Copy of the booklet is available to Blanchard operators addressing requests on their company letterheads.

Hargrave Welders' Clamps with patented anti-spatter screws for light and heavy service are illustrated and described in a two-color bulletin prepared by The Cincinnati Tool Co., 4038 Montgomery Rd., Cincinnati 12, Ohio. Specifications and prices of the clamps are included. Copy of Bulletin No. B 83 free upon request.

Weldon Angular Cutters for cutting dovetails and similar work are illustrated, described, and listed in a two-color circular issued by The Weldon Tool Co., 3000 Woodhill Rd., Cleveland 4, Ohio. Similarly treated are quick change holders with Morse taper holes for use with Weldon No. QA-50 quick change adapters. Copy of Circular ACH-1 free upon request.

Toolroom, Model Shop, and Machine Shop Equipment. The Erwood Co., 214 Woodstock St., Crystal Lake, Ill., has prepared a six-page pocket-size circular illustrating and describing its Electro Band Saw Brazer, V-425 Milling Machine and Drill Press Vise, and R6-6 Rotary Layout Table. Price information on each product is included. Copy free.

## WHITNEY- JENSEN PRODUCTS

Nos. 28-29-58-68

## **TOGGLE-ACTION FOOT PRESSES**

Throat Depths — 7" - 10" - 18" - 24" Capacity—2" thru 16 ga.

We can furnish any type of punches and dies—such as rounds, squares, etc.

Write for Catalog 16-48



Capacity—2" x 2" x 1/4" Angle Iron

WHITNEY METAL TOOL COMPANY





Ideal for handling and storing small quantities of small parts. Boxes slotted on 1" centers to accommodate dividers. Label holder on front for easy identification of contents. Pull handles on front only. Drawers finished in baked green. Dividers furnished at slight extra cost.

#### Other Sizes and Styles Available

				Finish92c ea.
				Finish1.06 ea.
93	BCH	81/4×113/4×25/8	Green	Finish99c ea.
94	BCH	81/4×173/4×25/6	Green	Finish1.18 ea.

Send for Catalog

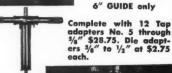
All Prices F.O.B. Philadelphia Plant Phone — Wire — Write

Telephone BAldwin 9-1805

BAY INC. 3015 North 16th St. PAL

## LASSY UNIVERSAL TAP and DIE GUIDE

\$18.75 f.o.b.



Used on Lathe, Drill Press, and Jig Borer or as

Tap

Wrench.



Write for circular from your mill supply house or:

#### LASSY TOOL COMPANY

90 Bohemia Street Plainville, Conn.
Also complete line of Hand Tappers

Lima Electric Motors. The Lima Electric Motor Co., Dept. CR, Lima, Ohio, has released a six-page two-color bulletin illustrating and describing the company's line of electric motors for industrial applications, as well as its gearshift drives, pedestal grinders, and polishing and buffing lathes. Copy of Bulletin MB-1 free upon request.

Numberall Selective Numbering Heads. The Numberall Stamp & Tool Co., Huguenot Park, Staten Island 12, N. Y., is now distributing a bulletin which illustrates and describes its Model No. 82 Numbering Head for use in all stamping operations requiring quick selective numbering. Also pictured and described are two-wheel rotary steel stamps for numbering and lettering, as well as a rotary date stamp. Copy free upon request.

"Under Cover Information" is the title of a four-page two-color bulletin released by The Heald Machine Co., Worcester 6. Mass., which is devoted to the new Heald Chuck Type Internal Grinder. The various outstanding features comprising the machine, such as the versatile feed control, core plate and valves, diamond unit, and removable motor pump and tank, are individually illustrated and described. Copy free upon request.

Cullman Speed Reducers. An unusually comprehensive 24-page booklet describing speed reducers has been made available by the Cullman Wheel Co., 1352 Altgeld St., Chicago 14, Ill. Contained in the booklet is considerable helpful engineering information, including 30 working drawings of practically every type of single and double reduction speed reducer for motors ranging from ½ to 15 horsepower. Copy free upon request.

Parkson Gear Tester. The George Scherr Co., Inc., 198-A Lafayette St., New York 12, N. Y., announces the publication of a 10-page two-color folder illustrating and describing the various models of the Parkson Gear Tester in sizes ranging from 4½ to 36-inch capacity. The folder fully discusses the Parkson gear testing system and points out how rapidly gear faults and errors can be determined by its employment. Copy free upon request.

mod gineer cago page and d drives presses shape list o the b

Aja color a con been Coup bulle Flexi Type brake coup! steel Capa cover the c

teres

ing

head

332

Modern Motor Drives. The Nichols Engineering Co., 2400 W. Madison St., Chicago 12, Ill., now has available an eightpage two-color bulletin which illustrates and describes a complete line of motor drives for lathes, screw machines, presses, milling machines, drill presses, shapers, and other machine tools. A price list of the various drives is included in the bulletin, copy of which is available free upon request.

Ajax Flexible Couplings. A 24-page fivecolor bulletin containing working data on
a complete line of flexible couplings has
been published by the Ajax Flexible
Coupling Co., Inc., Westfield, N. Y. The
bulletin covers the many types of Ajax
Flexible Couplings, including standard
Types S and A, as well as shear pin,
brake drum, bolt-on, and detachable hub
couplings. Data are presented on forged
steel and cast semi-steel construction.
Capacity and dimensional information
covers the wide range of sizes in which
the couplings are available.

Copy of Bulletin 48 is available to interested mechanical executives addressing requests on their company letter-

heads.

lec-

has

il-

y's

ap-

res.

ıff-

ree

ds.

ue-

ow

tes

er-

ra-

er-

ing

ate

tle

sed

6.

ald

za-

ng

ed nd nd

le-

lly

ng

ld

he r-

ng

n-

er e-

1-

18

in

10

ts

28

Respiratory Protection Chart. A chart suggesting the proper respiratory protection against more than 150 specific dusts, vapors, and gases has been published by the American Optical Co., Southbridge, Mass. The chart presents a summary of recommendations made by the Safety Engineering Division of the American Optical Company for the use of the company's R-1000, R-2000, and R-9100 respirators, all three of which have been approved by the U. S. Bureau of Mines. The respiratory hazards are listed alphabetically in the chart, with the proper protection clearly and easily identifiable. Copy free upon request.

Verson Gang Punching Machines. A four-page two-color bulletin, identified as the No. GPM-48 and issued by the Verson Allsteel Press Co., 9300 S. Kenwood Ave., Chicago 19, Ill., describes the firm's line of gang punching machines which are particularly designed for increasing the production of items requiring multiple punching of holes in steel sheets and plates. The bulletin describes all mechanical features and presents full specifications for the complete line of 12 machines. Copy free upon request.



"AIR-RESTER"

## FOR SAFETY'S SAKE . . . ARREST THAT DUST

GRINDING - BUFFING - POLISHING

. . . Here's the SELF-CONTAINED, CYCLONE EQUIPPED STANDARD "AIR-RESTER" for use wherever abrasive dust is involved.

This machine with its material handling fan costs no more than less efficient dust collectors with air handling fans!

Code Explanations:

C—Cyclone

F—Flame proof

Filtering Pads

DE—Drawer Enclosure D—Removable Drawer

M-Motor

SF—Suction Fan

G-Removable Grille

Work Safely! Write today for Bulletin 112.

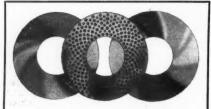
PROMPT DELIVERY

THE STANDARD ELECTRICAL TOOL CO.

2487 River Road

.

Cincinnati 4, Ohio



# FLAT RACE BALL THRUST BEARINGS WITH BRONZE RETAINERS

These bearings (in stock) range from  $\frac{1}{2}$ " to  $3\frac{1}{2}$ " shaft diameter; from  $1\frac{7}{3}$ " to  $5\frac{7}{3}$ " outside diameter. Larger sizes can be made to 2" outside diameter.

Send us your blueprints or write for catalog.

## ACORN BEARING CO.

NEW BRITAIN

CONNECTICUT

## Mounted Grinding Wheels & Points ASSEMBLED IN HANDY SETS



KIT No. 20—25 Pieces—1/8" Spindles. In lots of 10 sets...\$5.69 ea. 1 Set, \$7.98 KIT No. 30—20 Pieces—1/4" Spindles. In lots of 5 sets...\$7.29 ea. 1 Set, \$9.98

Also sold separately.

MONEY BACK GUARANTEE
Mail orders filled promptly

Toledo Manufacturers Supply Co.
429 Summit St.
Toledo, Ohio

L & J Open Back Inclinable Punch Presses are featured in an eight-page two-color catalog published by the L & J Press Corp., Elkhart, Ind. Illustrated, descriptive, and detailed specification data are presented on back geared and plain flywheel type presses of various capacities. Copy free upon request.

İ

pos

3 2

La

bor

pla

tip.

app

ske

cor

eac

He

six

Dr

Ch

for

an

she

an

Sp

Quatt

an

Co

B/W "Hi-Power" Solenoid, a small space alternating current unit which is designed to provide an unusual amount of power when equipped with standard duty coils and said to be ideal for heavy duty service on valves located where ambient temperatures are extremely high, such as near boilers, is illustrated and discussed in a four-page two-color bulletin prepared by the B/W Controller Corp., Birmingham, Mich. Copy Bulletin SOL-2 free upon request.

Cambridge Conveyor Belts for the conveying and treatment of industrial products covered in a 132-page wire-bound catalog published by The Cambridge Wire Cloth Co., Cambridge, Md. Wellillustrated throughout, the catalog is divided into eight sections having the following headings: Cambridge Belt Applications; Cambridge Belt Constructions; Choice of Material (Metals and Alloys); Cambridge Belt Specifications; Cambridge High Temperature Belts (Lehr and Industrial Furnace Belts); Conveyor Design; Installation and Operation; and Tables, Questionnaires, etc.

tion; and Tables, Questionnaires, etc. Copy of the catalog is available to shop officials addressing requests on their company letterheads.

De Laval Single Stage Centrifugal Pumps are featured in a 28-page twocolor catalog issued by the De Laval Steam Turbine Co., Trenton, N. J., which presents outstanding details of De Laval design and construction, lists pump ratings, and incorporates essential dimensions. Designed to enable engineers to readily select the required pump, estimate motor size, and plan approximate installation dimensions, the catalog contains information on all G, I, K, L, M, and P single stage single and double suction pumps, as well as brief descriptions of such optional features as mechanical shaft seals, self-priming systems, and vertical mountings. Copy of Catalog 83-29 free to mechanical executives.

Landis Tool Standard and Special Purpose Cylindrical Grinders are outlined in a 28-page two-color catalog issued by the Landis Tool Co., 16 E. 6th St., Waynesboro, Pa. The catalog covers universal, plain, roll, crankshaft, cam, valve, multiple wheel, and race grinders. Design features are explained in the front section by the use of diagrams. The machine applications are illustrated throughout the catalog by the use of operation sketches. Illustrations, descriptions, and condensed specifications are included for each type of grinder. Copy free.

nch

age

& J

ed.

ion

and

ous

all

is

unt

ard

VY

m-

gh,

nd

nl-

ler

tin

n-

d-

nd

ge

11-

di-

ollis;

nhr

aop

al

ch

al t-

nto

i-

1,

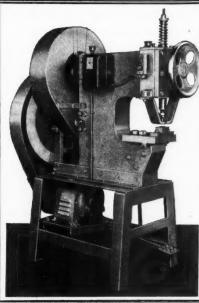
18

Quadrill Four-Position Turret Drill Head is illustrated and described in a six-page folder prepared by the Chicago Drillet Corp., 1729 N. Winchester Ave., Chicago 22, Ill. Uses of the head for performing drilling, tapping, counterboring, countersinking, reaming, spot-facing, and other drill press operations are shown and described. Also illustrated and described are the Drillet Instant Speed Changer for drill presses and the Quad-Tapper, a self-reversing tapping attachment having a ¼-inch tap capacity and designed for use on the Quadrill. Copy free upon request.

Decimal-Fraction Calculator. A decimal-fraction calculator designed for use in adding and subtracting fractions and converting fractions to decimals or vice versa has been developed by the Wendt-Sonis Co., Hannibal, Mo. The calculator is available free to individuals addressing requests on their company letterheads.

"Di-Acro" Die-Less Duplicating Catalog No. 48-14. Publication of a 40-page catalog covering its line of equipment for the die-less duplicating of parts or pieces to die accuracy is announced by the O'Neil-Irwin Manufacturing Co., 306 Eighth Ave., Lake City, Minn. The catalog commences with a discussion of the origin of the Di-Acro system of Die-Less Duplicating and then presents, in turn, illustrated and descriptive information on rod parters, benders, shears, notchers, punches, brakes, and radius brakes. Examples of parts produced on the various pieces of equipment are also shown. The final page of the catalog includes a description of the company's free engineering service.

Copy of Catalog No. 48-14 is available free to mechanical executives addressing requests on their company letterheads.



# **NEW --- SINGLE END PUNCHING MACHINE**

For Light Structural Fabricating.
Punches Web and Flanges of Beams
and Channels.

Punches Legs of Angles and Tees.

FEATURES: Steel Plate Frame

Non-repeat clutch
Punch lowered by hand wheel
for accurate centering

#### SPECIFICATIONS:

Capacity—9/16" through ½". Throat—12" Speed—60 strokes p. m. Motor—2 HP, 1800 RPM

## JULIUS BLUM & CO., INC.

534 WEST 22ND ST., NEW YORK 11, N. Y. Telephone: Watkins 9-7042

Bristol Socket Screws. A folder containing information on the application of multiple-spline and hex socket set and cap screws has been published by The Bristol Co., Mill Supply Division, Waterbury 91, Conn. Copy of Folder No. DM860 free upon request.

Hauser No. 249 Optical Hardness Tester for cylindrical parts down to 0.0025-inch diameter and flat parts down to 0.0020-inch thickness is illustrated and described in a four-page two-color folder now being distributed by the Hauser Machine Tool Corp., 74 Bournedale Rd., N. Manhasset, N. Y. Copy free upon request.

Electro-Automatic Tool-Lifter, available in four types for shaping machines, small table planing machines, mediumsize table planing machines, and large table planing machines respectively, is illustrated and described in a four-page two-color catalog now being distributed by the Deca Co., 4. N. Avalon Rd., Great Neck, N. Y. Prices of the tool-lifter are included. Copy free upon request.

PANT RIVETERS

Pioneers in the riveting field. Head rivets from smallest to ¾" diameter, either by noiseless spinning or vibrating harmer method.—Sizes to meet all needs.—Types include Vertical and Horizontal Multiple Spindles. Write for literature—and don't forget to send samples.

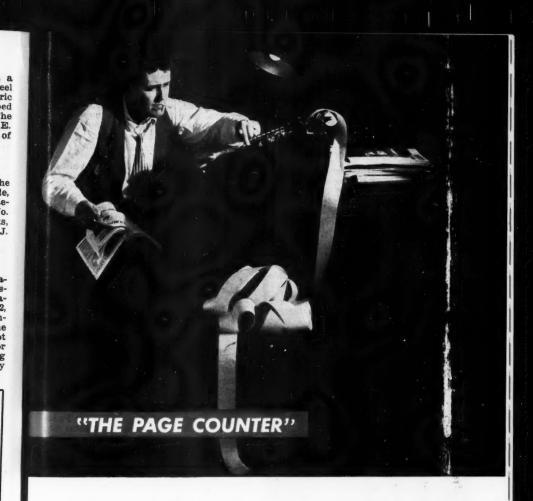
THE GRANT MFG. & MACHINE CO.
96 Silliman Ave. Bridgeport 5, Conn.

Climax Type H Flexible Coupling, a hose type flexible coupling with all-steel bodies for direct connected ¼ h.p. electric motor drives, is illustrated and described in a two-color bulletin prepared by The Climax Flexible Coupling Co., 863 E. 140th St., Cleveland 10, Ohio. Copy of Bulletin No. 88 free upon request.

Sperry Supersonic Reflectoscope. The operation and application of a portable, lightweight Type SR05 Supersonic Reflectoscope is described in Bulletin No. 3001, a publication of Sperry Products, Inc., 1505 Willow Ave., Hoboken, N. J. Copy free upon request.

Cleveland Model 200 Die Casting Machine. A four-page two-color bulletin issued by The Cleveland Automatic Machine Co., 4932 Beech St., Cincinnati 2, Ohio, describes in detail a universal high-pressure hydraulic die casting machine which can be furnished either with a hot metal end for casting zinc tin, or lead, or as a cold chamber machine for casting aluminum, magnesium, or brass. Copy free upon request.





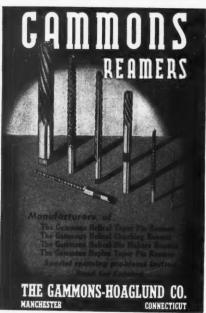
Because MODERN MACHINE SHOP contains nearly 400 pages of editorial features and blue ribbon advertisers, this guy is afraid his advertising won't be read. Says he'd rather be in a thin book for better display. Using the same logic, he would set up a retail store in the desert rather than in the main shopping district because there is less competition.

### WHAT HE DOESN'T UNDERSTAND IS

that MODERN MACHINE SHOP is a veritable market place for metal working equipment. Buyers shop where the most merchandise is for sale. Each issue of MODERN MACHINE SHOP exhibits the greatest variety of machines and tools available to buyers for their selection. It's an action-producing, digest size book that pulls inquiries which turn into sales. Results tell the story. Gardner Publications, Inc., Cincinnati 2, Ohio.







Palmer Vertical Milling Attachment for bench lathes is covered as to construction features, applications, price, specifications, and so on, in Bulletin 548 now available free from Palmer Industries Inc., 6149 S. Sangamon St., Chicago 21, Illinois.

Lyon-Raymond Model 66 Hydraulic Sheet Feeding Table with capacity of 10,000 lb. and range of elevation from 28 to 44 inches is illustrated and described in a bulletin issued by the Lyon-Raymond Corp., 6060 Madison St., Greene, N. Y. Copy of Bulletin No. 260, Supplement 1 free upon request.

"The Perfect Cutting Tool" is the title of a four-page two-color folder now being distributed by the Triangle Equipment Co., Inc., 45 River Rd., Nutley, N. J., which presents illustrated, descriptive, and tabular information on a line of diamond-bonded tools, including files, mounted tools, and wheels. Copy free upon request.

Paragon Conversion Unit, designed specifically for converting hand-operated arbor presses into air presses, is illustrated and described in a two-color circular now being distributed by Paragon Metal Products, 844 W. Adams St., Chicago 7, Ill. Price information on the unit, as well as on a 3-way foot valve for use with same, is included. Copy free upon request.

"Ducter" Low Resistance Ohmmeter. The James G. Biddle Co., 1316 Arch St., Philadelphia 7, Pa., has released a 12page two-color bulletin on its "Ducter" Low Resistance Ohmmeter for measuring resistance down to 0.000001 ohm. A veritable handbook on low resistance measurements in the shop and in the field, the bulletin contains illustrations, wiring diagrams, and charts supplementing the easy-to-understand text on the various aspects of low resistance testing, its application, and so on. Some of the subjects covered include electrical maintenance tests of cable and conductor joints, oil circuit breaker assemblies, rotating equipment, transformers and coils, and test for controlling manufacturing and assembly processes. Copy of Bulletin 24-25-35 free upon request.

pissing valve issue chine kind small grine show ation gedra

Pag Cha has faci: gand man gan bon carl to t beed deposuit Cop

> NI wi

Diamond Grinders. A catalog describing various diamond grinders for use by steel mills, shear knife manufacturers, valve manufacturers, and so on, has been issued by The Bridgeport-Diamond Machine Co., 2362 Main St., Stratford, Conn. The catalog illustrates various types and kinds of machine parts, both large and small, which can be produced on the grinders and also includes illustrations showing the ease and facility of operation in all controls, as well as the ruggedness of the equipment. Copy free.

ent

on-

ice.

548

us-

ago

llie

of

28

in nd

Y.

: 1

le

p-

1e

8,

r

e

Page Hard Surfacing Electrodes. The Page Steel & Wire Division, American Chain & Cable Co., Inc., Monessen, Pa., has issued a booklet covering hard surfacing electrodes, including special manganese nickel shielded arc electrodes, manganese shielded arc electrodes, manganese nickel bare electrodes, high carbon shielded arc electrodes, and medium carbon shielded arc electrodes. According to the booklet, each of the electrodes has been developed to provide a weld metal deposit whose particular properties are suited to definite welding applications. Copy of Booklet DH45 free upon request.

Swanson Thread Comparator, an instrument expressly designed for precision production gaging, is illustrated and fully described in a four-page two-color folder prepared by The National Automatic Products Co., 23 Whiting St., New Britain, Conn. Copy free upon request.

Service "Bi-Way" Studder, a combination stud driver and extractor, is illustrated and described in a four-page twocolor bulletin issued by the Service Tool Co., 311 North Ave., Westfield, N. J. Specifications of the various models in which the unit is available are included. Copy of Bulletin No. 100 free.

Tucker Oilers. A four-page two-color folder published by The W. W. & C. F. Tucker, Inc., 618 Capitol Ave., Hartford 6, Conn., presents illustrated, descriptive, and tabular information on various styles of oil cups and oil hole covers for all types of lubricated equipment. A separate sheet included in the folder lists prices of the oil cups and oil hole covers. Copy of folder free upon request.



Carbide Gages. Savings as high as \$20,000 annually are described in a 12-page case history brochure on carbide gages now available from Lincoln Park Industries, Inc., 1719 Ferris Ave., Lincoln Park 25, Mich. The brochure samples typical reports received by Lincoln Park Industries which show how the use of carbide is reducing inspection costs for gage users. Several case studies illustrate various advantages of carbide gages. Copy of the brochure is available free to individuals addressing requests on their company letterheads.

Cincinnati Shears. A 32-page catalog illustrating and describing its general line of shearing machines has been published by The Cincinnati Shaper Co., Cincinnati 25, Ohio. Shown are typical applications of the various shears covered. In addition to complete descriptive information on the features of the machines, data sheets listing standard sizes are included. Moreover, the catalog illustrates and describes special equipment for shearing operations.

Copy of Catalog S-5 is available to mechanical executives addressing requests on their company letterheads.

SPECIAL \$19.50

V-425 MILLING MACHINE
AND DRILL PRESS VISE

with these features that meet your most exacting requirements:

Swivel base calibrate in 90-0-90° of rotation.
Jaw width, 4 inches. • Jaws provided with hardened steel, replaceable plates. • Vise openings, 2½, 6, depth 16. • Removable semi-steel handle and heat treated clamping screw. • Base and body cast of semi-steel; all surfaces not machined are finished in a baked wrinkle finish. • 4 slots properly secure vise to the machine. • Rigid construction reduces chatter and assures long cutter life.
Send your order to DEPT. MM.

THE ERWOOD COMPANY
214 WOODSTOCK STREET
CRYSTAL LAKE, ILLINOIS

"Mac" Revolving Centers and Stops. A four-page leaflet published by The Whitfield Manufacturing Co., Washington Court House, Ohio, presents illustrated, descriptive, and tabular information, including prices on revolving centers and stops. Copy free.

"Fluidmotion" Radii and Angle Dressers for modern form-dressing are featured in an eight-page, two-color illustrated booklet published by the J & S Tool Co., Inc., East Orange, N. J. The booklet shows some of the forms obtainable with the dressers, lists specifications of the various models, and presents operating instructions. Copy free.

Topflight Tape, a pressure-sensitive cellophane and acetate tape printed to specifications for use in marking parts, wires, and tubing, as well as coding, checking, and so on, is illustrated and described in an eight-page booklet published by the Topflight Tape Co., Division of Topflight Tool Co., Inc., York, Pa. Numerous applications of the tape on a wide variety of products are illustrated and explained. Copy of Booklet DM1 free upon request.

Congress Drives for light machinery are illustrated, described, and listed in a 12-page three-color catalog issued by the Congress Division, Tann Corp., 3750 E. Outer Dr., Detroit 12, Mich. Covered are "A" and "B" type V-grooved pulleys, variable pitch pulleys, V-step cone pulleys, "R" type pulleys, flush hub pulleys, crown face pulleys, flexible couplings, and fractional horsepower V-belts. Copy of Catalog CD-300 free upon request.

H-P-M All-Hydraulic Presses for metal working and process industries are pictured and described in a 12-page two-color bulletin issued by the Hydraulic Press Manufacturing Co., Mount Gilead, Ohio. Covered are platen presses, single and double-action metal drawing presses, inclinable presses, for ming presses, stretch-forming presses, forcing presses, shaft straightening presses, block and briquetting presses, presses for powder metallurgy, die casting machines, extruding presses, molding presses, laboratory presses, molding machines, bending presses, horn presses, scrap metal balers, and other equipment. Copy of Bulletin 4804 free upon request.

IMMEDIATE DELIVERY

HIGH SPEED STEEL, STRAIGHT SHANK

## TWIST DRILLS

Extra Length



### 9" CUTTING FLUTES-12" LONG DRILLS

SIZE	LENGTH OVERALL INCHES	LENGTH FLUTES INCHES	PRICE EACH NET	SIZE	LENGTH OVERALL INCHES	LENGTH FLUTES INCHES	PRICE EACH NET
1/8"	12	9	\$ 1.50	21/64"	12	9	\$ 2.25
9/64"	12	9	1.50	11/32"	12	9	2.25
5/32"	12	9	1.50	23/64"	12	9	2.50
11/64"	12	9	1.50	3%"	12	9	2.50
3/16"	12	9	1.50	25/64"	12	9	2.75
13/64"	12	9	1.60	13/32"	12	9	2.75
7/32"	12	9	1.60	27/64"	12	9	3.00
15/64"	12	9	1.75	7/16"	12	9	3.00
1/4"	12	9	1.75			9	
17/64"	12	9	1.85	29/64"	12	-	3.25
9/32"	12	9	1.85	15/32"	12	9	3.25
19/64"	12	9	2.00	31/64"	12	9	3.25
5/16"	12	9	2.00	1/2"	12	9	3.25

HIGH SPEED STEEL, TAPER SHANK

## TWIST DRILLS

Extra Length

SIZE INCHES	LENGTH OVERALL INCHES	LENGTH FLUTES INCHES	PRICE EACH NET	SIZE	LENGTH OVERALL INCHES	LENGTH FLUTES INCHES	PRICE EACH NET
17/32"	15	12	\$ 6.50	27/32"	15	12	\$11.50
9/16"	15	12	7.00	7/8**	15	12	12.00
19/32"	15	12	7.50	29/32"	15	12	12.50
%"	15	12	8.00	15/16"	15	12	13.00
21/32"	15	12	8.00	31/32"	15	12	14.00
11/16"	15	12	8.25	1"	20	15	16.00
23/32"	15	12	8.50	1-1/16"	20	15	17.00
3/4"	15	12	8.50	1-1/8"	20	15	18.00
25/32"	15	12	9.50	1-3/16"	20	15	20.00
13/16"	15	12	11.00	1-1/4"	20	15	22.00

## VICTOR MACHINERY EXCHANGE, INC.

251 Centre St. Phone: CAnal 6-5575 New York 13, N. Y.

ops. The

ingtrama-

en-

88ea-

us-She in-

er-

elci-

in he ht

ty d.

e E. re is, s,

## SERVICES DIRECTORY

GRINDING • STRMPINGS • TOOL and DIE WORK MACHINE WORK . CASTINGS . HERT-TREATING FORGINGS . EMPLOYMENT . RUSINESS . ETC.

#### PRECISION GROUND CAMS GEARS **SPLINES** THREADS

Excellent facilities for grinding gears, cams, threads and splines on a contract basis.

SEND BLUEPRINTS FOR ESTIMATE

## HARTFORD SPECIAL MACHINERY COMPANY

300 HOMESTEAD AVE. Hartford, Conn.

### PATTERNS

Wood and Metal — also Match Plates. For all kinds of castings—large or small. Estimates on Request.

C

GENERAL PATTERN WORKS 2231 Buck St., North of Harrison Ave. Phone MAin 4751 Cincinnati, O Cincinnati, Ohio

### **AUTOMATIC AND HAND** SCREW MACHINE PRODUCTS

... up to 11/2" diameter — any material — small or large quantities. Prompt service.

IMSANDE SCREW PRODUCTS CO. 3517 Cardiff Ave., Oakley, Cincinnati, Ohio

## PRECISION GRINDING

A complete grinding service—Centerless, Internal, External, Blanchard, Plain Surface and Thread Grinding. Also a full production service including Tool and Die, Metal Stamping, Screw Machine and assembling departments. Send prints, sketch or samples for quotation.

ACE MANUFACTURING CORPORATION 1235 E. Erie Avenue Philadelphia 24, Pa.

## **Dovetail. Flat and Circular Form** Tools, Reamers, Counterbores

Prompt, Efficient Service. Attractive Prices Send Your Inquiries to-

ANDERSON, INC. 6603 W. Diversey Ave. Chicage 35, Illinois

### BAKELITE SILENT GEAR SERVICE

ALL SIZE BLANKS IN STOCK.

Teeth Cut To Your Specifications. Prompt Delivery. Write for quotation.

Greaves Machine Tool Co. 2009 Eastern Avenue Cincinnati, Ohlo

CENTERLESS GRINDING — Straight cylindrical, shoulder, profile and multiple diameters, any material analysis; also non-ferrous materials. Accurately ground taper pins and straight dowel pins.

Brown & Sharpe and Swiss Automatic screw machine parts, heat treated and ground if necessary. Light bench type production drilling. Expanded facilities insure prompt and accurate service. Send blue prints or samples for estimates. The Porter Machine Co., 3139 Enyart Ave., Cincinnati 9, Ohio.

#### REPRESENTATIVE WANTED

To handle our Precision Collet Chuck and Expanding Mandrel lines. These quality tools present an excellent opportunity for men willing to push a fairly recent but well received and thoroughly tested product.

#### DREWCO CORPORATION

1600 Junction Avenue

Racine, Wisconsin

## DIE CUSHIONS

for all press requirements.

Ask our engineers.

DAYTON ROGERS
Manufacturing Company

Minneapolis 7, Minn.

The Very Best Pacilities For . .

# STAMPINGS

IN SMALL LOTS

DAYTON ROGERS

Manufacturing Company

Minneapolis 7, Minn.

## WANTED General Superintendent

to take charge of plant manufacturing small gears and precision parts. Must have engineering and practical shop background and be familiar with all phases of manufacturing, inspection and heat treating. Plant employs 250 to 300 people and is located in Middle West. Good opportunity for right man. Give age, nationality and full details regarding experience and training, also give salary expected.

ADDRESS
Box No. 125, MODERN MACHINE SHOP
431 Main St., Cincinnati 2, Ohio

## Manufacture to your specification:

High speed cutting tools, flat, circular and dovetail forms.

Jigs, fixtures, machined details and experimental work.

Blanchard Grinding Service up to 40" diameter chuck.

Prompt delivery
Write for Quotations

Territories Available for Representation

LINCOLN PARK MFG. CO.

3304 Dix Road

Lincoln Park, Mich.

#### ADVERTISING MAN

A progressive Michigan machine tool mfr. producing a wide and varied line needs a young man having technical and sales training and ability to write machinery selling copy and handle all phases of machinery advertising. Please state age, experience, salary wanted. Confidential. Write Box No. 123, Modern Machine Shop, 431 Main St., Cincinnati 2, Ohio.

ADVERTISING RATES for Services Directory SENT UPON REQUEST

Write Modern Machine Shop

GRIND THE

Eastern Centerless Way

Our new plant with increased facilities

## PROMPT SERVICE

Eastern Centerless Grinding Co. 470 Tolland Street East Hartford 8, Conn

## WHERE TO GET IT



Dril Dril Dril

Dril Dril Dril

Dril Dril

Dril

Dril

Driv

Dus

Enc

Eng

Env

Etcl

File

File

File

File

Filt

Fin

Fle

For

Fur

Ga

Ga

Ga

Ge

Ge

Gri

Gri

Gri

Gri

Gri

Gri

Gr

Ha

De

#### Numbers shown are page numbers in this issue

Abrasive Cloth, Paper, Discs, Belts, Stones, Etc., 59, 79, 171, 178, 179, 225 Adapters, 201 Air-Operated Equipment (Look for specific

Angles, 172 Arbors, 201

Backstands, 140, 141
Balancing Machines, 7, 186
Balancing Ways, 248
Bar Stock, 62, 127
Bases, Machines, 250
Beading Machines, 292
Bearings, Ball, 97, 318, 334
Bearings, Roller, 97, 318
Bearings, Sleeve, 127

Bearings, Thrust, 97 Belt Fasteners, 203 Belting, 203

Benches, Work, 169, 301 Bending Machines, 148, 196, 227

Bins, 169, 204 Blades, Cutting-Off, 150, 271

Blocks, Gage Test, 313 Bolts, 244, 255, Fourth Cover

Boring and Turning Machines, Vertical, 89 Boring Bars, 324

Boring, Drilling and Milling Machines, Horizontal, 113

Boring, Drilling and Tapping Machines, Multi-

ple, 57 Boring and Facing Toolheads, 206

Boring Heads, 72, 266
Boring Machines, 3, 38, 113
Boring Mills, Horizontal, 91
Boring Mills, Vertical, 113

Boxes, Shop, 169, 277, 332

Brakes, Press and Bending, 105, 131, 132, 133,

212, 227
Brazing Equipment, Band Saw, 294
Broaches, 284

Buffers, Portable Electric, 237
Buffing Machines, 140, 141, 237, 356

Buffing Machines, 140, 141, 237, 356 Burrs, 180, 287, 330

Bushings, Drill Jig, 160, 229, 249, 275, 289 Bushings, Sleeve, 259

Calipers, Vernier, 293
Cams, 249, 263, 342
Carbides, 17, 35, 52, 70, 139, 197, 242, 260, 322
Centers, Bench, 162
Centers, Lathe, Planer, Miller, Etc., 76, 89, 95, 250, 263, 288, 296, 328

Chasers, 29

Chippers, Portable Pneumatic, 34

Chucking and Indexing Fixtures, 278 Chucking Machines, Automatic, 69, 181

Chucks, Air. 46, 243 Chucks, Collet. 255, 342 Chucks, Drill, 201, 314 Chucks, Diaphragm, 18

Chucks, Gear, 317

Chucks, Lathe, 46, 191, 250 Chucks, Magnetic, 81, 191, 231

Chucks, Tap, 201 Chucks, Universal, 191

Clamps, 64, 98, 258, 312, 321 Clamps, Air, 243

Cleaners, Vacuum, 268 Clutches, 125, 202, 280, 310

Collets, 259, 261 Compressors, Air and Gas, 34, 167

Coolants, 40, 107, 135, 207, 325 Coolant Units and Systems, 28

Counterbores, 51, 70, 153, 271, 318, 342

Countersinks, 51, 166, 262
Couplings, Air, 215
Couplings, Flexible, 280
Cut-Off Machines, 119, 170, 356
Cutter Sharpening Machines, 286

Cutters, Milling, 35, 48, 123, 153, 184, 271, 322 Cutters, Washer, 322

Cylinders, Hydraulic and Pneumatic, 61, 167, 213, 243

Degreasers, 176

Demagnetizers, 191, 257 Desks, 169

Diamonds and Diamond Tools, 232, 259

Diamond Powder, 259 Diamond Wheels, 238, 259

Die Cushions, Pneumatic, 343 Die Feeds, 205

Die Flippers, 33 Die Guides, 332

Die Heads, Threading, 2, 29

Die Lifting and Handling Machines, 117, 145, 220

Diemakers' Supplies, 236, 338 Die Making Machines, 39, 122, 279

Dies, 21, 26, 56, 175, 184, 245, 257, 290 Die Sets, 21, 223, 251, 274

Dividing Heads, 191, 286

Dogs, Lathe, Grinder and Miller, 98 Drawers, 332

**Dressing Tools.** 33, 55, 232, 296, 329 **Drill Heads.** 50, 144, 230, 259, 278

**Drill Heads.** 50, 144, 230, 259, 27 **Drill Pads.** 296

Drill Rods, 299
Drilling and Tapping Units, 94, 295, 317

Drilling Machines, Automatic, 303
Drilling Machines, Bench, 117, 147, 220, 239

Drilling Machines, Horizontal, 109 Drilling Machines, Multiple Spindle, 24, 259, 303 Drilling Machines, Radial, 15, 24, 109, 115 Drilling Machines, Vertical, 10, 15, 20, 27, 96, 109, 113, 309 Drilling Units, 317 Drills, Center, Core, Twist, Square, Etc., 70, 95, 153, 184, 198, 249, 271, 341 Drills, Hand, 249 Drills, Hard Steel, 198 Drills, Portable Electric, 13, 34, 124, 159, 237, 356 Drills, Portable Pneumatic, 13 Drives, Motor, 128, 143, 200 Dust Control Equipment, 235, 302, 333, 356 Engines, Diesel, 34 Engraving Machines, 226 Envelopes, 272 Etchers, 285 Files, 59, 177, 199, 287 Files, Band, 228 Files, Portable Electric, 237 Files, Rotary, 180, 253, 287 Filing Machines, 122, 228, 279 Filters, 28 Finishing Machines, Abrasive, 140, 141 Flexible Shaft Equipment, 49, 154, 237, 309 Forming Machines, Roll, 174, 292 Furnaces, Heat-Treating, 155, 219, 247 Gage Contacts, Diamond, 284 Gages, 18, 67, 84, 139, 184, 217, 275, 316, 349 Gaskets, Leather, Rubber, Etc., 304 Gear Cutting Machines, 286 Gears and Gear Units, 5, 11, 203, 250, 252, 257, 262, 272, 276, 342 Grinders, 189 Grinders, Abrasive Band and Disc. 140, 141 Grinders, Abrasive Belt, 140, 141, 251 Grinders, Air, 43, 253, 308 Grinders, Bench, 297, 356 Grinders, Carbide Tool, 137, 140, 141, 238 Grinders, Centerless, 8, 9 Grinders, Cutter and Tool, 12, 39, 53, 58, 194 Grinders, Cylindrical, 8, 9, 140, 141 Grinders, Drill, 39, 71, 113, 276 Grinders, External, 30 Grinders, Face Mill, 39 Grinders, Flute, 194 Grinders, Internal, 30 Grinders, Jig, 33 Grinders, Pedestal, 140, 141, 143, 208, 237, 356 Grinders, Portable and Tool Post, 356 Grinders, Portable Electric, 185, 237, 306, 356 Grinders, Profile, 279 Grinders, Surface, 14, 47, 71, 209, 269 Grinders, Swing Frame, 320 Grinders, Tap, 71 Grinders, Thread, 6 Grinders, Universal, 71 Grinders, Valve Seat, 237 Grinding Fixtures and Attachments, 10, 307 Grinding Wheels, 59, 80, 178, 179, 189

Hand Tools, Power (Look for specific item) Handwheels, 172 Hardness Testing Devices, 83 Hinges, 256, 326 Hobs, 153 Hoisting and Conveying Machinery, 167, 310 Holders, Knurl, 92 Holders, Tap. 240, 295 Holders, Tool, 52, 70, 98, 150, 240, 300 Holders, Type, 26, 305, 328 Hole Locators, 33 Honing Machines, 38, 151 Hydraulic Equipment (Look for specific item) Indenters, Diamond, 83 Indicators, 217, 316 Iron Working Machines, 131, 132, 133, 292 Jig Borers, 10, 15, 33, 109, 130 Jigs and Fixtures, 18, 84, 259, 343 Keys, Socket Screw, 255 Keyway Broaching Kits, 4 Keyway Cutting Machines, 164 Knives, 59 Knobs, Machine, 172 Knurls, 290 Lapping Machines, 8, 9, 38 Lathe Converters, 292 Lathes, Automatic, 7, 19, 23, 82, 86 Lathes, Bench, 239 Lathes, Engine and Toolroom, Front Cover, 68, 89, 93, 113, 115, 147, 195, 254, 312, 339, Third Cover Lathes, Polishing, 140, 141 Lathes, Speed, 294, 356 Lathes, Turret, 7, 19 Layout Materials, 138, 310 Levers, Pull-Feed, 172 Lighting Equipment, 336, 347 Locating Tools, Optical, 256, 270 Mallets, Rawhide, 203 Mandrels, Expanding, 258, 283, 342 Marking Machines, 36, 253 Milling Machine Attachments, 221 Milling Machines, Hand, 129 Milling Machines, Herizontal, 8, 9, 93 Milling Machines, Profile, Contour, Engraving, 226 Milling Machines, Turret, 72 Milling Machines, Universal, 10, 129 Milling Machines, Vertical, 10, 130 Mills, End. 48, 73, 153, 184, 271 Molds, 84 Motors, 143, 234, 309 Mounted Points and Wheels, 185, 334 Nails, 233 Nibblers, 190, 254 Notchers, 227 Nut Runners, Portable Pneumatic, 13 Nut Setters, Portable Electric, 13, 237, 356 Oil Groovers, 146 Pans, Tote, 276 Pantographs, Second Cover, 226

Hammers, Plastic, 330

Hammers, Forge, Power-Driven, 259

Dec

Parallels, 172 Parts, Machine, Aircraft, Production, Etc., 18 Patterns, 342 Piercing Machines, 335 Pinion Cutting Machines, 286 Pins, 255, 338 Planer-Millers, 91 Planers, 91, 113 Plates, Surface, 168, 172 Polishing Machines, 140, 141, 237 Polishing Wheels, 80 Powders, Metal, 149 Presses, Air, 243 Presses, Arbor, 163 Presses, Hydraulic, 37, 75, 131, 132, 133, 161, 163, 213 Presses, Power, 21 Presses, Pneumatic, 213 Presses, Punch, 16, 78, 85, 90, 253, 315, 323, Presses, Sub. 286 Pulleys, 310 Pumps, Coolant and Lubricant, 44 Pumps, Hydraulic, 119 Pumps, Vacuum, 34 Punches, 84, 227, 245, 257, 282 Punch Press Feeds, 90, 253 Racks, Bar and Tube, 169, 280 Racks, Machine, 255, 272 Reels, Stock, 291 Reamers, 88, 95, 153, 166, 184, 257, 271, 326, 338, 342 Reamers, Portable Electric, 237 Reciprocating Tools, Electric, 74 Rests, Work Blade, 201 Resurfacing Materials, Floor, 267 Riveting Machines, 118, 213, 224, 285, 298, 336 Rivets, 224, 233 Rods, Drill, 299 Roll Feeds, 56, 90 Safety Equipment, Press, 136 Sanding Machines, 147 Saw Blades, Band, 25, 59, 217, 246, 249 Saw Blades, Circular, 54, 214 Saw Blades, Hack, 22, 25, 59, 214, 217, 246, 249 Saw Blades, Slotting, 211, 271 Saw Blades, Special, 271 Saw Frames, Hack, 246, 249 Saw Guides, Band, 347 Sawing Machines, 113 Sawing Machines, Band, 147, 183 Sawing Machines, Circular, 54, 147 Sawing Machines, Hack, 22, 78, 191, 251 Saw Sharpening Machines, 194 Scrapers, Hand and Power, 248 Screw Drivers, Hand, 159, 241, 249 Screw Drivers, Portable Electric, 13, 356 Screw Drivers, Portable Pneumatic, 13 Screw Driving Machines, Power, 222 Screw Machines, Automatic, 57, 69 Screws, Cap. Set. Socket and Machine, 187, 233,

Screw Thread Inserts, 352 Second-Operation Machines, Front Cover Services: Milling, Grinding, Lapping, Rebuilding, Repairing, Business, Etc., 84, 263, 273, 290, 342, 343 Shapers, 41, 66, 78, 93, 105 Sharpening Fixtures, 320 Shearing Machines, 105, 131, 132, 133, 227, 281, Shears, Portable Electric, 159 Shims, 242, 264 Slotting Machines, 113 Sockets, 98, 173, 241 Soldering Irons and Tips, 312 Spacing Tables, 109 Special Machinery, 7, 24, 113, 259, 286, 303, 317 Speed Reducers, 32 Spindles, Drilling, 282 Splines, 342 Spot Facers, 318 Sprockets, 252, 272 Stampings, Pressed Metal, 236, 343 Stamps, 26, 259, 265, 305, 328 Steel, Die, 42, 59 Steel Stock, Ground Flat, 42, 210, 217 Straightening Machines, 248 Studs, 244 Superfinishing Machines, 7, 56, 140, 141 Surfacing Machines, Abrasive, 244 Swaging Machines, 259 Styli, Diamond, 284

Tables, Elevating, 117, 145, 184, 220 Tables, Rotary and Index, 142, 228, 270, 291 Tachometers, 316 Tapes, Measuring, 217 Tap Extractors, 296 Tappers, Hand, 332 Tappers, Portable Electric, 237 Tapping Attachments, 188, 265, 295, 319 Tapping Machines, 19, 20, 45, 96, 117, 220, 295 Taps, 31, 51, 152, 175, 184, 189, 257, 271, 311 Threading Machines, 19, 60, 96, 286 Thread Rolling Machines, 65, 290 Tool Bits, 17, 139, 197, 198, 214, 242, 260, 271, 322 Tool Blanks, 17, 322 Tool Blocks, 320

Tools, Boring, 52, 206, 218, 284 Tools, Diamond, 284 Tools, Facing, 52, 206 Tools, Form, 95, 123, 342, 343 Tools, Internal Threading, 52, 218 Tools, Radius, 314 Tools, Recessing, 201 Tools, Special Cutting, 95, 153, 263 Transfer Punches, 282 Turrets, Lathe, 272, 327

Valves, 61, 63, 77, 119, 165, 213 Vibration Absorption Equipment, 193 Vernier Height Gages, 139 Vises, Bench and Machine, 74, 92, 98, 191, 228, 243, 262, 280, 286, 300, 304, 329, 340

Wrenches, 98, 173

Screws, Transfer, 266, 300

241, 244, 255, 324, Fourth Cover

1,

7

## CARTER Guide-Line LIGHT

"The Shadow that Guides a Saw"

## SPEEDS UP & IMPROVES STRAIGHT-LINE SAWING





Don't let increased labor and lumber costs put you behind the eightball. The installation of CARTER Guide - Line LIGHTS on your straight-line saws will speed up your production and improve your cutting job . . . "The Shadow that Guides a Saw," projected by the Carter Guide-Line LIGHT, is a straight, sharp, black line that shows your operator instantly and exactly where each saw cut will be made. A tilting device permits the shadow to be cast either as a center guide or a base line at either right or left side of the stock. . . . Write TODAY for complete data on this time and material saving precision light.

## **CARTER PRODUCTS COMPANY**

959 MICHIGAN TRUST BLDG.

GRAND RAPIDS 2, MICHIGAN

## REMEMBER WAY BACK WHEN ...



... DRIFTERS OR BOOMERS WENT FROM JOB TO JOB . . . AND CARRIED THEIR TOOL-BOXES IN THEIR POCKETS : . . A TWELVE INCH SCALE AND A PAIR OF CALIPERS?

"Labor-Management Cooperation for Increased Productivity" is the title of a 48-page booklet now being distributed by the American Management Association, 330 W. 42nd St., New York 18, N. Y. The contents of the booklet cover the following topics:: "Joint Development of Standards," "Plant-Wide Incentives," "Merit Rating in a Job Shop," and "The Human Factor in Production." Copy of the booklet, which is designated as Production Series No. 175, is available at a price of \$1.00.

"Design of Gear Teeth," a fundamental factor in the proper functioning of gears, is the subject of a 16-page booklet published by the Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill. Incorporating detailed information based on the experience of Illinois Tool engineers, the booklet deals extensively with the inter-relationship of gear tooth design, finished gears, and the tools used to produce them. Copy of the booklet is available free to gear designers and mechanical engineers upon request.

## YOUR FIRST and WISEST CHOICE

Eliminate fumbling and guessing when gaging Holes, Slots, Finding Centers, Locations, Etc.
Horberg Drill Size Pin Gages are accurate to +.0001 -.0000.





## DEPENDABLE GAGING

• Overall Length 11/2" • Lower Half Concentric Tapered for Easy Insertion and Alignment for Holes down to .0012 smaller • Oil Hardened Tool Steel. No other pin gage has such accuracy at so low a cost.

## INDIVIDUAL STOCK SIZES \$1.00 each

LETTER SETS: 52 gages from A to Z—\$45 FRACTION SETS: 60

gages 3/4" to 1/2" in steps of 1/4"—\$50

NUMBER SETS: 120

gages I to 60—\$90



Sets come in pairs for gaging any number of similar holes. All sets include stands of 3 plates and cover, so that gages stand upright. Drill size is plainly stamped in front of each hole, together with decimal equivalent to the ten-thousandth of an inch.

Prices F.O.B. Bridgeport, Conn. Immediate Delivery.

THE Horbery GAGE COMPANY

19 STAPLES STREET, BRIDGEPORT I CONF

## Over the Editor's Desk

## "God Help America"

CONSIDERING all of the alibis, excuses, explanations, and "I-told-you-so's" that have been offered by press and radio since the election, we might be wise to talk of something else. But we think one more comment is necessary, and that one is "God help America."

We say that not because the Democratic party will remain in control of our government; as individuals, Democrats are in every respect the same as Republicans. Not because Truman will continue in the presidency; after all, Truman is but one person, and no one person can ruin America alone. We say "God help America" because the time has come that the two groups which in Russia are symbolized by the hammer and sickle—the manual workers and the farmers—apparently have decided to cast aside all moral considerations in order to obtain material advantages for themselves at the expense of the rest of the American population.

The heads of America's great labor organizations are scheming and working day and night to obtain control of this great nation by using their unions to obtain control of America's industries—and whoever controls America's industries controls America. The Democratic candidate for president promised these labor leaders that in return for the votes of their unions he would give them whatever legislation they wanted, including repeal of the Taft-Hartley law and a return to the Wagner Act. The Taft-Hartley law gave the owners of America's industries somewhere near an even break with the labor unions; the Wagner Act gave all of the advantages to the unions and eliminated all semblance of justice so far as the employers were concerned. This is the program to which Truman is committed.

Always a clever politician and vote-getter, Franklin Roosevelt conceived the idea of raising the prices for farm products by paying farmers to reduce their crop-acreage—probably the most illogical, unsound abortion of the laws of natural economy ever foisted upon an unsuspecting public. Added to this were laws which called upon the government to buy all surplus crops at 90 per cent of the market price over a given period of time. As a result of these laws, thousands of farmers have for many years been receiving checks from the government for not growing crops which they had never grown and wouldn't have grown anyway—as any honest farmer will testify. Other thousands have sold millions of bushels of grain, potatoes and other farm produce to the government at highly inflated, fictitious prices—all paid for out of the taxes that all the rest of the American people pay.

What became of these huge quantities of farm products? Millions of bushels are stored in government granaries and warehouses, waiting for the Lord knows what. Millions of bushels have been destroyed by burning, by crushing, and by dumping in the ocean or by other means. Vast quantities of potatoes were purchased from the farmers at prices in the neighborhood of \$2.20 a bushel and then sold back to the farmers again for "stock feed" at prices as low as  $1 \ensuremath{\psi}$  a bushel. This is nothing more nor less than a legalized tribute, paid out of the ever-mounting taxes levied upon the American people.

of the and i tryin highedemon must

those profe who the ling will

whe marture poin Soci

> gov des bro min

in r

mor

and are Am fore Farmers have to pay taxes, of course, but they can well afford to pay their share of the taxes out of the contribution that is made to them by the rest of the population and have plenty left. Union members have to pay taxes also, but they are continually trying to meet their tax obligations, with the prospects of having some left, by forcing higher and higher wage increases. The employers, in order to meet the government's demand for higher taxes and the unions' demands for higher and ever higher wages, must necessarily increase the prices of their products.

The burden of this situation is increasingly being shifted onto the shoulders of those who are neither farmers nor union members—the millions of business and professional men, store workers, office workers, sales people, engineers, and others who will one day decide that prices have gone too high and will quit buying all but the barest necessities. When that day comes, manufacturers will reduce their working forces in accordance with the reduced demands for their goods, unemployment will mount, and another depression will be in the making.

This situation will not develop next year and possibly not for several years, because whenever it seems imminent the government will throw more paper money into the market, further inflating the currency and weakening an already tottering price structure. The inevitable crash must come, and when it comes the labor union heads will point to the failure of capitalism and demand a labor-Socialist government. And Socialism is only a step from Communism.

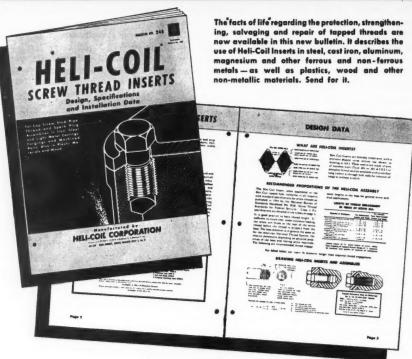
What would happen under Socialism? The government would be so beset by increased wage demands from all the labor organizations that it would be forced to declare a moratorium on further wage increases. England, with a labor government in power, has reached that point already. In France the people wanted more and more for doing less and less, until chaos reigned. They then decided that order could be restored only by the government taking over certain major industries, including the coal mines.

In recent weeks the French government-employed miners struck against their government employer, and in their rage at not being able to obtain higher wages destroyed some of the mines. Soldiers were sent to protect the mines and fighting broke out between the miners and the soldiers. Many lives have been lost, and many mines have irreparably been damaged. Four million tons of coal have been lost and the price of coal has risen 50 per cent.

Let no one think "it can't happen here." It can, and will unless America's workers and farmers change their "get-more-for-less" way of thinking. The American people are living well today; better than the people of any other country on Earth. The American farmer who farmed intelligently lived well even before the government forced his city friends to pay tribute to him. Let us be satisfied with a good living, and keep America a healthy and prosperous nation.

Howard Campbee

# DESIGN ENGINEERS—send for the facts of life regarding screw threads!



1609 U.S. For Oil

The Heli-Coil\* Screw Thread Insert, invented just before World War II, was used almost entirely on aircraft engines during the war. But, after V-J Day, manufacturers of all types of products involving the use of threaded fastenings began to take advantage of the improvement offered by these Inserts. In appliances, automobiles, industrial machinery and many other applications, Heli-Coil Inserts were quickly adopted for the protection,

strengthening and repair of tapped threads and for simplification of design.

Bulletin #248, just off the press, is a compact booklet containing complete information regarding design, specifications and installation data for Heli-Coil Screw Thread Inserts. It is offered free of charge to design engineers and others who are

interested in the design, manufacture and inspection of products containing threaded fastenings. Send for your copy today.

## HELI-COIL CORPORATION

Formerly AIRCRAFT SCREW PRODUCTS COMPANY, Inc. 47-23G 35th STREET, LONG ISLAND CITY 1, N. Y.

352 MODERN MACHINE SHOP

Aba

Acc

Acm Aco Adv Aero Age Alli Alm Amo Amo Amo

Am Ch And

Atla Aut Aut Bala Bar Bay Bay

Ben

Ben

Bes

Bev

Bic

Bla

Blu

Boi Bok

Bri Bro

Bro

Bul

Bus

Dec



## VERTISEMENTS

Abart Gear & Machine Co272
Abrasive Products, Inc171
Accurate Bushing Co
Acme Industrial Co
Acme Machine Tool Co82
Acme Tool Co
Acorn Bearing Co334
Advance Machine Works312
Aero Tool Co
Aget-Detroit Co302
Allied Products Corp
Almond Mfg. Co. T. R
Alofs Mfg Co 257
Alofs Mfg. Co
American Pipe Bending Machine Co., Inc148
American Products Co321
American Steel Foundries89
American Swiss File & Tool Co
American Tool Works Co 115
American Tool Works Co
Charges Corn 149
Anderson Bros Mfc Co 248
Amplex Mig. Co., Div. of       149         Chrysler Corp.       149         Anderson Bros. Mfg. Co.       248         Armstrong-Blum Mfg. Co.       22         Armstrong Bros. Tool Co.       98         Arter Grinding Machine Co.       30
Armstrong Drog Tool Co
Armstrong Bros. Tool Co
Arter Grinding Machine Co
Atlantic Gear Works276
Atlas Press Co.       195         Auto Engraver Co., Inc.       226
Auto Engraver Co., Inc226
Auto Moulding & Mfg. Co326
Auto Moulding & Mig. Co326
Baldor Electric Co
Baldor Electric Co
Baldor Electric Co.       290         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251
Baldor Electric Co.       297         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332
Baldor Electric Co.       290         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay. Inc.       332         Bay State Abrasiva Products Co.       225
Baldor Electric Co.       290         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay. Inc.       332         Bay State Abrasiva Products Co.       225
Baldor Electric Co.       290         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay. Inc.       332         Bay State Abrasiva Products Co.       225
Baldor Electric Co.       290         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay. Inc.       332         Bay State Abrasiva Products Co.       225
Baldor Electric Co.       290         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay. Inc.       332         Bay State Abrasiva Products Co.       225
Baldor Electric Co.       290         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       224
Baldor Electric Co.       290         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       224
Baldor Electric Co.     297       Barber-Colman Co.     35       Baumbach Mfg. Co., E. A.     251       Bay, Inc.     332       Bay State Abrasive Products Co.     225       Bay State Tap & Die Co.     175       Bear Mfg. Co., Industrial Div.     186       Behr-Manning, Div. of Norton Co.     79       Behr Products Co.     324       Bems & Call Co.     221       Benchmaster Mfg. Co.     920
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Besly & Co., Charles H.       189
Baldor Electric Co.       291         Barber-Colman Co.       36         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Besly & Co., Charles H.       189         Beverly Shear Mfg. Co.       281
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       .79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Besly & Co., Charles H.       189         Beverly Shear Mfg. Co.       281         Bicknell-Thomas Co.       318
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Besly & Co., Charles H.       189         Beverly Shear Mfg. Co.       281         Bicknell-Thomas Co.       318         Black Drill Co.       198
Baldor Electric Co
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Besly & Co., Charles H.       189         Beverly Shear Mfg. Co.       281         Bicknell-Thomas Co.       318         Black Drill Co.       198         Bloomfield Tool Corp.       249         Blum & Co., Inc., Julius       335
Baldor Electric Co. 291 Barber-Colman Co. 35 Baumbach Mfg. Co., E. A. 251 Bay, Inc. 322 Bay State Abrasive Products Co. 225 Bay State Tap & Die Co. 175 Bear Mfg. Co. Industrial Div. 186 Behr-Manning, Div. of Norton Co. 79 Behr Products Co. 324 Bemis & Call Co. 221 Benchmaster Mfg. Co. 90 Besly & Co., Charles H. 189 Beverly Shear Mfg. Co. 381 Bicknell-Thomas Co. 318 Black Drill Co. 198 Bloomfield Tool Corp. 249 Blum & Co., Inc., Julius 335 Bologe-Crane, Inc. 147
Baldor Electric Co. 291 Barber-Colman Co. 35 Baumbach Mfg. Co., E. A. 251 Bay, Inc. 322 Bay State Abrasive Products Co. 225 Bay State Tap & Die Co. 175 Bear Mfg. Co. Industrial Div. 186 Behr-Manning, Div. of Norton Co. 79 Behr Products Co. 324 Bemis & Call Co. 221 Benchmaster Mfg. Co. 90 Besly & Co., Charles H. 189 Beverly Shear Mfg. Co. 381 Bicknell-Thomas Co. 318 Black Drill Co. 198 Bloomfield Tool Corp. 249 Blum & Co., Inc., Julius 335 Bologe-Crane, Inc. 147
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Bely & Co., Charles H.       189         Bicknell-Thomas Co.       318         Black Drill Co.       198         Bloomfield Tool Corp.       249         Blum & Co., Inc., Julius       335         Boice-Crane, Inc.       147         Bokum Tool Co.       52         Brewster-Souires Co.       285
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       .79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Besly & Co., Charles H.       189         Beverly Shear Mfg. Co.       281         Bicknell-Thomas Co.       318         Black Drill Co.       198         Blomfield Tool Corp.       249         Blum & Co., Inc., Julius       335         Bolce-Crane, Inc.       147         Bokum Tool Co.       52         Brewster-Squires Co.       285         Bridgeport Machines, Inc.       72
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Bely & Co., Charles H.       189         Bicknell-Thomas Co.       318         Black Drill Co.       198         Bloomfield Tool Corp.       249         Blum & Co., Inc., Julius       335         Boice-Crane, Inc.       147         Bokum Tool Co.       52         Brewster-Squires Co.       285         Bridgeport Machines, Inc.       72         Prighton Scraw & Mfg Co.       255
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Bely & Co., Charles H.       189         Bicknell-Thomas Co.       318         Black Drill Co.       198         Bloomfield Tool Corp.       249         Blum & Co., Inc., Julius       335         Boice-Crane, Inc.       147         Bokum Tool Co.       52         Brewster-Squires Co.       285         Bridgeport Machines, Inc.       72         Prighton Scraw & Mfg Co.       255
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Bely & Co., Charles H.       189         Bicknell-Thomas Co.       318         Black Drill Co.       198         Bloomfield Tool Corp.       249         Blum & Co., Inc., Julius       335         Boice-Crane, Inc.       147         Bokum Tool Co.       52         Brewster-Squires Co.       285         Bridgeport Machines, Inc.       72         Prighton Scraw & Mfg Co.       255
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Bely & Co., Charles H.       189         Bicknell-Thomas Co.       318         Black Drill Co.       198         Bloomfield Tool Corp.       249         Blum & Co., Inc., Julius       335         Boice-Crane, Inc.       147         Bokum Tool Co.       52         Brewster-Squires Co.       285         Bridgeport Machines, Inc.       72         Prighton Scraw & Mfg Co.       255
Baldor Electric Co.       29f         Barber-Colman Co.       35         Baumbach Mfg. Co., E. A.       251         Bay, Inc.       332         Bay State Abrasive Products Co.       225         Bay State Tap & Die Co.       175         Bear Mfg. Co., Industrial Div.       186         Behr-Manning, Div. of Norton Co.       .79         Behr Products Co.       324         Bemis & Call Co.       221         Benchmaster Mfg. Co.       90         Besly & Co., Charles H.       189         Beverly Shear Mfg. Co.       281         Bicknell-Thomas Co.       318         Black Drill Co.       198         Blomfield Tool Corp.       249         Blum & Co., Inc., Julius       335         Bolce-Crane, Inc.       147         Bokum Tool Co.       52         Brewster-Squires Co.       285         Bridgeport Machines, Inc.       72

East Shore Machine Products Co. ......284
Eastern Tool Supply Co. ......139

Eclipse Counterbore Co.         70           Economy Engr. Co.         145           Economy Machine Products Co.         324           Economy Tool & Machine Co.         275           Electro-Mechano Co.         309	Johnson Bronze Co
Electro-Mechano Co309	Kennametal, Inc322
Elk Tools, Inc300	Kennametal, Inc
Enco Mfg. Co	Steel Foundries
Erwood Co	Knu-Vise, Inc64
Etteo Tool Co., Inc	i i
Ex-Cell-O Corp58	I & I Duore Corp. 915
	L & J Press Corp
F & M Sales, Inc142	
Falcon Tool Co 193	Laminated Shim Co., Inc264
Falls Products, Inc250	Landis Machine Co2
Falls Products, Inc.         250           Farrel-Birmingham Co., Inc.         5           Fellows Gear Shaper Co.         11	Lariayette Tool & Supply Co. 184 Laminated Shim Co., Inc. 264 Landis Machine Co. 2 Landis Tool Co. 12 Langelier Mfg. Co. 259
Fellows Gear Shaper Co	
Firth Sterling Steel & Carbide Corp197	Lassy Tool Co
	LeBlond Machine Tool Co., R. K Third Cover
FlexFOCK CO.   201	Lee Co., K. O
Foote-Burt Co	Lemert Engr Co
Forsherg Mfg. Co., M. A	Lemert Engr. Co
Fosdick Machine Tool Co	Leslie Welding Co323
runto opeciatios co., the	Lewthwaite Machine Co., T. H257
Fulmer Co., C. Allen38	Leslie Welding Co
	Littleford Bros., Inc250
G & D Sales Co	Lodge & Shipley Co.         82           Lucas & Son. Inc., J. L.         276
G & D Sales Co	Lucas & Son, Inc., J. L276
Gallmeyer & Livingston Co71	Luers, J. Milton         150           Luma Electric Equipment Co.         312
Gammons-Hoaglund Co	Lyon Metal Products Co
Gardner Machine Co	Lyon Metal Froducts Co
Gear Engr. & Mfg. Co.         262           General Engr. & Mfg. Co.         41	M-B Products308
Gilmore & Co., F. F. 984	Machine Products Corp172
Gisholt Machine Co	Madison-Kipp Corp253
Govro-Nelson Co94	Madison Mfg. Co
Graham & Co., Inc., John H 25	Mall Tool Co
Graham & Co., Inc., John H.         25           Graham Mfg. Co., Inc         92           Grant Mfg. & Machine Co.         336	Maplewood Mchy. Co292
Grant Mfg. & Machine Co336	Marshall Steel
Gray Machine Co.         190           Greaves Machine Tool Co.         250	Martin Machine Works, J. E286
Greenlee Brothers & Co	Marvel Tool & Machine Co
Greenlee Brothers & Co.         .57           Griffin Co., G. W.         .25	Matter Mfg. Co.         292           Matter Mfg. Co.         329           Matticks Mfg. Co.         329           McDonough Mfg. Co.         26
Grob Brothers228	Matticks Mfg. Co330
Grobet File Co. of America         287, 330           Gwilliam Co.         318	McDonough Mfg. Co276
Gwiniani Co	Mead Specialties Co
	Michigan Drill Head Co 144
Hall Mfg. Co	Milford Rivet & Machine Co224
Hamilton Tool Co	Milford Rivet & Machine Co.         224           Miller-Knuth Mfg. Co.         251           Milwaukee Chaplet & Mfg. Co.         279
Hammond Mchry. Builders, Inc	Modern Machine Shop
Hanson-Whitney Machine Co. 6   Hardings Brothers, Inc.   First Cover     Harvey Mfg. Corp. 122   Hassall, Inc. John 233	Molina Industrial Diamond Co259
Hardinge Brothers, IncFirst Cover	Moline Tool Co303
Harvey Mrg. Corp122	Monarch Machine Tool Co
Heald Machine Co	Montgomery & Co., Inc
Heimann Mfg. Co. 266	Morris Machine Tool Co24
Heli-Coil Corp352	Morton Machine Works
Hendey Machine Co	Motch & Merryweather Co54
Hevi-Duty Electric Co	Motor Tool Mfg. Co
Hilliard Corp	Mullimett-Dixon Co
Hilliard Corp. 202 Hjorth Lathe & Tool Co. 312	
Hoggson & Pettis Mfg. Co	National Acme Co
Horhers Gage Co	National Twist Drill & Tool Co. 153 Nebel Machine Tool Co. 339
Horberg Gage Co.         349           Hossfeld Mfg. Co.         196	New Britain Machine Co New
Huber Gear & Wheel Co	Britain-Gridley Machine Div69
Humm Safety Equipment Co., John136	New Britain Machine Co., New Britain-Gridley Machine Div. 69 New Method Steel Stamps, Inc. 328 Niagara Machine & Tool Works 131, 132, 133
Hydraulic Press Mfg. Co. 161 Hy-Pro Tool Co. 31	Niagara Machine & Tool Works131, 132, 133
	Nichols Engr. Co., Modern Motor Drives Div
** ** * * * * * * * * * * * * * * * * *	Nichols-Morris Corp129
Ideal Industries, Inc	Nichols-Morris Corp

Niel Nor Nor Nor Nor Nur Nur

Oliv Olly O'N

One

Pal Par

Pen

Pit

Pit Pro

Pro Pro

Pro Pro Qu

Ra Re Re

Re Re Ric Ric Ric Ro Ro

Ro Ro Ru Ru

D

Nielsen Tool & Die Co.       300         Norgren Co., Inc., C. A.       215         Norma-Hoffmann Bearings Corp.       .97         Northland Sales & Mfg. Co.       .304         Norton Co.       .178, 179         Numberall Stamp & Tool Co.       .305         Nu-Tangs, Inc.       .273         Oliver Instrument Co., Inc.       .39         Oliver Mchry, Co.       .224         O'Neil-Irwin Mfg. Co.       .227         Onondaga Tool Corp.       .326         Ottemiller Co., Wm. H.       .244	Standard Electrical Tool Co.         333           Standard Gage Co., Inc.         67           Standard Pressed Steel Co.         241, 301           Standard Steel Specialty Co.         256           Stanley Electric Tools         159           Staples Tool Co.         95           Starrett Co., L. S.         217           Sterling Factory Equipment Co.         276           Stevens Inc., John B.         270           Stites Tool Co.         263           Stuart Oil Co., D. A.         325           Sturdimatic Tool Co.         107           Sundstrand Machine Tool Co.         162           Sunnen Products Co.         151           Sutton Tool Co.         261
Pannier Corp.       26         Parker-Kalon Corp.       187         Fenn Riv-It & Machine Co.       224         Phillips Mfg. Co.       176         Pittsburgh Stamp Co., Inc.       259         Pittsburgh Tool Steel Wire Co.       295         Production Evsfety Chuck Co.       295         Production Devices, Inc.       262         Production Machine Co.       244         Producto Machine Co.       223         Prosser & Son, Thomas       137	Taft-Peirce Mfg. Co.       .84         Tannewitz Works       .183         Teeter, C. B.       .314         Thompson Grinder Co.       .14         Thompson Mfg. Co.       .296         Thornton Mechanical Laboratory       .269         Toledo Mfgrs. Supply Co.       .334         Tomkins-Johnson Co.       .118         Torit Mfg. Co.       .235         Troyke Mfg. Co.       .286, 291         Tungsten Electric Corp.       .260
Queen City Machine Tool Co208	
Racine Tool & Machine Co.       119         Reading Machine Co.       164         Reed Rolled Thread Die Co.       290         Reiff & Nestor Co.       257         Rettool Corp.       271         Republic Steel Corp., Union Drawn Div.       62         Rice Pump & Machine Co.       279         Richards Industries, Inc.       300         Rivett Lathe & Grinder, Inc.       53         Roberts Rubber Co., Weldon       80         Rockford Clutch Div., Borg-Warner Corp.       125	United States Drill Head Co. 230 United States Electrical Tool Co. 237 United States Electrical Tool Co. 237 United States Hoffman Mchry. Corp. 28 United States Steel Supply Co. 42 Universal Engr. Co. 160 Universal Transfer Punch, Inc. 282  V & O Press Co. 253 Van Products Co. 228 Victor Mchry. Exchange, Inc. 341 Viking Tool Co. 342 Vimco Mfg. Co. 336
Ross Operating Valve Co	vimco Mig. Co336
Ruleta Co., Inc	
S & S Machine Works       256         Sales Service Machine Tool Co.       78         Samson Mfg. Co.       310         San Angelo Foundry & Mchry. Co.       174         Sanford Mfg. Co.       209         Savage Co., W. J.       254         Schauer Machine Co.       294         Scheric Co., Inc., George       316         Schmidt, Inc., Geo. T.       38, 253         Schrillo Aero Tool Engr. Co.       51         Schultes Level, Inc.       200         Schultz & Anderson Co.       338         Screw Machine Specialty Co.       290         Scilly-Jones & Co.       201         Selbert & Sons, Inc.       282         Seneca Falls Machine Co.       23         Service Machine Co.       23         Services Directory       342, 343         Severance Tool Industries, Inc.       166         Sheldon Machine Co.       59         Simonds Abrasive Co.       59	W. L. S. Stamping Co.       236         Wade Instrument Co.       272         Walker Co., Inc., O. S.       231         Walls Sales Corp.       251         Waltham Machine Works       256         Walton Co.       296         Wardwell Mfg. Co.       194         Warner & Swasey Co.       194         Watson-Flagg Machine Co., Inc.       65         Watts Bros. Tool Works       249         Weldon Tool Co.       48         White & Bagley Co.       207         Whitney Metal Tool Co.       331         Whyte Engr. Co.       56         Wickman Corp.       228         Wiedemann Machine Co.       146         Willey's Carbide Tool Co.       55         Wilson, K. R.       75         Wilson Mechanical Instrument Co.       83         Winter Bros. Co.       152         Wolf & Co., Ltd., S.       124         Wood & Spencer Co.       311         Woodworth Co., N.A.       18
Skilsaw, Inc	
Skilsaw, Inc.   13	Young Arbor Co258
South Bend Lathe Works239, 272, 296, 320 Stackbin Corp	Ziegler Tool Co., W.M240

127 .29

322 .89 .10

# ORDER NOW... for PROMPT DELIVERY!

Increased production now enables us to make exceptionally prompt delivery of THE CINCINNATI Electrical Tools. You can plan now to have your needs served quickly.

A. BALL BEARING PEDESTAL GRINDER—Designed and built for continuous production work and all general purpose grinding. Sizes: Up to 15 H.P.

**B.** BUFFING AND POLISHING LATHE—Especially designed, ruggedly built, for continuous service under most severe conditions. Sizes: Up to 15 H.P.

C. TOOL POST GRINDER—With or without feed, especially adapted for grinding lathe centers, cutters, reamers, rolls, dies, etc. Can be used in shaper or planer for surface grinding. Sizes: 1/4 to 1 H.P.

D. BENCH GRINDER—Powerful—ball bearing equipped. For all kinds of grinding and general purpose buffing and polishing. Sizes: 6, 7, 8, 10, and 12 inches.

WRITE TODAY FOR COMPLETE DETAILS

#### WE MANUFACTURE

Tappers
Routers
Nut Setters
Speed Lathes
Screw Drivers
Electric Drills
Aerial Grinders
Tool Post Grinders

Abrasive Cut-Off Machines Bench and Pedestal Buffers

Air Master
Dust Collectors
Bench and Pedestal
Grinders

TRADE

The Gineinnailly

ECTRICAL TOOL CO.

R

Division of THE R. K. LeBLOND MACHINE TOOL CO.

2625 MADISON ROAD . CINCINNATI 8, OHIO

## 'twas the night before Christmas

Twas the fight before Christinas

When an curry hit tie shop

Not a pulley was turning

Complete was the stop.

And over the tooling

The was knen with case.

Had bung to their sock.



How the boss in the meantime
With satisfied glee.
Had a plan of his own
Of what was to be.
To speed up his plant
And loosen the spell

And profits as well.

With a heave and a toss
He throw out the lathes
That were causing his loss.
And in the front oper

He pulled in the crates
Marked "Made by LeBlond."



That now were made bare
He set the "LeBlonds"

With the greatest of care
When finished he rose
With a sabshed grin
For the very best Christmas



A Christmas to span
Over many a year.
A Christmas they it welcome
With hearty good cheer.
"It's the Very best gift

I could give them," said h
"The one gift that pleases
Both violamen and me."



They'll from every record

For product and time.

Economically smart...

The mark of a genius,



## ACCURACY assured

Facts - (1) made from special analysis alloy steel (2) scientifically heat treated to develop the utmost in the necessary physical properties (3) heads, bodies and threaded portion perfectly concentric (4) bodies are ground (5) threads are perfect in lead and held to Class 3 Thread Fit (6) checked and gauged to the Holo-Krome rigid standards of accuracy during each step in production (7) and finally, every single bolt individually hand inspected before packaging . . . . Accuracy is assured in H-K Stripper Bolts and in all Holo-Krome quality Socket Screw Products. For guaranteed unfailing performance specify "Holo-Krome".

H.K Distributors give prompt service from their warehouse stocks. Try 'em!



THE HOLO-KROME SCREW CO